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AF Zoom-Nikkor ED 80-200mm f/2.8D

REPAIR MANUAL

Nikon | NIKON CORPORATION
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⚠1

INSPECTION OF ENCODER SIGNAL

※ Use an F90 (N90) camera body and checking & adjustment programs for F90／N90 to display encoder signal on the computer monitor when making an inspection.

Inspection method

- Start the checking & adjustment programs for F90／N90 and select " E. Checking of AF lens communication ". Make inspection according to instructions as shown on the display.

- Encoder signals should be as described in the table below when the zoom and distance scale are set to specified positions.

＊No. 400001～

- MF mode

Zoom ring / Distance scale position	f＝80mm			f＝105mm			f＝200mm		
	Encoder signal								
	1	2	3	1	2	3	1	2	3
Most infinity position	19h	C2h		79h	C2h		C9h	C2h	
Infinity position							C9h	C3h	
4m							CFh	C3h	
Most close distance position							CCh	C2h	

- AF mode

Zoom ring / Distance scale position	f＝80mm			f＝105mm			f＝200mm		
	Encoder signal								
	1	2	3	1	2	3	1	2	3
Most infinity position	19h	DEh		79h	DEh		C9h	DEh	

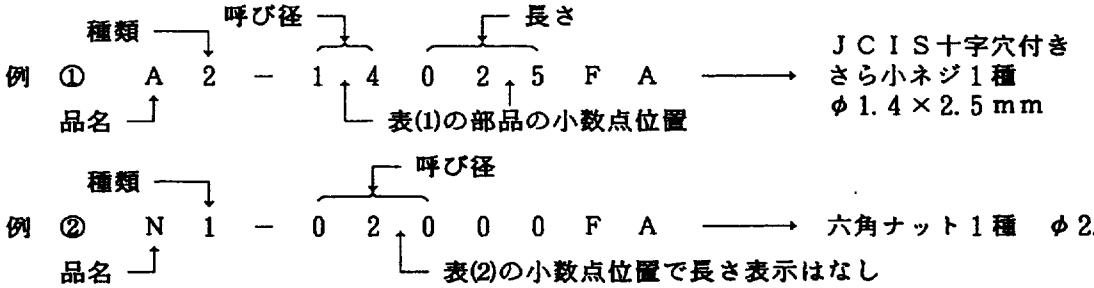
◎ If encoder signal values are different from those shown in the table, following causes moust be considered.
Distance brush is mounted in the wrong position, distance brush or FPC is defective, encoder patterns on the FPC are contaminated, or the FPC is fixed in the wrong position.

サービス課
M

記号説明　MARKS IN THE PARTS LIST

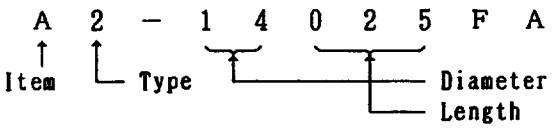
(1) 機械標準品

下の表に示す機械標準品の部品番号は品名、種類、呼び径、長さを示しています。



(1) Standard mechanical parts
Reference Number in the Parts List

A. Screw ・Pin



B. Nut ・Washer・Snap ring

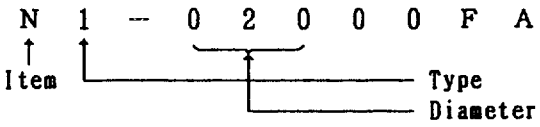


表 1

品名 Item		種類 Type	
ＪＣＩＳ 十字穴付き小ねじ１種 Cross-point screw 1	A	なべ Pan	1
		さら Countersunk	2
		丸さら Oval	3
ＪＣＩＳ 十字穴付き小ねじ３種 Cross-point screw 3	B	なべ Pan	1
		さら Countersunk	2
		丸さら Oval	3
十字穴付き小ねじ Cross-point screw	C	なべ Pan	1
		さら Countersunk	2
		丸さら Oval	3
		トラス Trus	4
十字穴付きタップタイタイトねじＢ型 Cross-point tapped screw B	F	なべ Pan	1
		さら Countersunk	2
十字穴付きタップタイタイトねじＢ型１種 Cross-point tapped screw B1	G	なべ Pan	1
		さら Countersunk	2
		丸さら Oval	3
十字穴付きタップタイタイトねじＢ型３種 Cross-point tapped screw B3	H	なべ Pan	1
		さら Countersunk	2
		丸さら Oval	3

品名 Item		種類 Type	
すりわり付き止めねじ Splitted set screw	K	丸先 Round point	1
		とがり先 Cone point	2
		くぼみ先 Half point	3
六角穴付き止めねじ Hexagon socket head set screw	L	とがり先 Cone point	2
		くぼみ先 Half point	3
		平先 Normal	4
六角穴付きボルト Hexagon socket head bolt	M		1
		M2, M2.6	2
平行ピン Straight pin	P		1
		ステンレス Stainless steel	5
テーパーピン Taper pin			2
スプリングピン Spring cotter		一般用 Normal	3
		軽荷重用 Light	4

表 2

品名 Item		種類 Type	
六角ナット Hexagon nut	K	１種 Type 1	1
		１種 Type 3	3
平座金 Washer	R	小形丸	1
		みがき丸	2
ばね座金 Spring washer			5
Ｅ型止め環 E-snap ring	S	Ｅ型 Type E	1
		Ｇ型 Type G	2
		GS型 Type GS	3

(2) 販売区分欄 The term of sale colum

記 号 Mark	説 明 Explanation	
○	Can be Supplied individually	単独部品として販売するもの
△	Not supplied individually but only as subassembly.	部組品でなければ販売しないもの
○△	Supplied either as part or subassembly	単独部品でも部組品でも販売するもの
×	Not considered as repair part	修理部品と考えないもの
※	Should be sent to the factory if the repair needed.	単体では交換できないので、組む場合に工場での加工が必要なもの
⊠	Delivered as a product from the sales department (i.e., not supplied as repair part)	商品として販売店で販売しているもの（修理部品扱いはしない）

(3) 備考欄 The remarks colum

F-601M	Part number used in common	共通部品番号
(Blue ×125mm)	Lead wire (color × length)	コードの色と長さ
53F-2013 (FM-780028)	Technical information ref. number (number in parenthesis; English edition)	製品技術資料No. ( )内は英文
(2.1×3.8 ×0.07)	Washer (internal diameter × external diameter×thickness)	ワッシャー (内径×外径×厚さ)
(Black)	Black-finished parts	黒部品
(d=0.2)	Diameter of wire	線型＝0.2
(t= 1)	Thickness	厚さ＝1
Rev.	Revision	訂正
Add.	Addition	追加
Dis.	Discontinuation	廃止
OLD	Parts of the intial design	旧部品
◆	Limited part	ＲＰ限定出庫部品
RP-9001	Repair part information No.	ＲＰ情報Ｎｏ.
R1.., D1...., W1... C1.., Q1...., P1...	Abbreviation for electronic part	電気部品記号
TA-0003	Number (TA-****) are order numbers of adhesive tape. (For the order of adhesive tape, the number 1K***-*** is not use).	接着テープ要求部番 (1K***-*** では部品要求できません。)
W-0056BE	Number (W-0056BE) are order numbers of Lead wire. (For the order of Lead wire, the number 1K***-*** is not use).	リードワイア要求部番 (1S***-*** では部品要求できません。)

＊ VERSATILE PART

＊ 既出部品

Apart maked with this pentagonal symblo is used commonly in the arcitecture of other products. That is called "VERSATILE PART". Note that every part, bearing new part number of eleven places, will turn into a VERSATILE PART when it is used in the design of future product.

テープ類ＴＡ設定部品一覧表

TAPES AND FILMS WITH PREFIX ALPHABETS TA

Dec. 17, 1991

部品 No. Part No.	名称 Name of part	色 Color	厚さ Thickness (t=mm)	幅 Widhs (mm)	長さ Length (m)	要求単位 Q'ty for a unit for crdering
TA－0001	ポリエステルフィルム Tape	透明 Transparent	0.025	10	30	1巻 1 roll
TA－0002	ポリエステルフィルム Tape	透明 Transparent	0.025	20	30	1巻 1 roll
TA－0003	両面接着テープ Both sided adhesive tape	白 White	0.16	10	2	1巻 1 roll
TA－0004	両面接着テープ Both sided adhesive tape	黒 Black	0.14	12	50	1巻 1 roll
TA－0005	ポリエステルフィルム Tape	黄 Yellow	0.06	19	66	1巻 1 roll
TA－0006S	アセテートクロス（シート） Tape (200x120/sheet)	黒 Black	0.23	6	200 (mm)	1set (20pcs)
TA－0007	銅泊導電性 Tape, copper foil	銅泊 Copper foil	0.11	4	6	1巻 1 roll
TA－0008	ポリエステルフィルム Tape	透明 Transparent	0.055	30	30	1巻 1 roll
TA－0009	カプトンフィルム Tape	琥珀 Amber	0.07	6	30	1巻 1 roll
TA－0010	両面接着テープ Both sided adhesive tape	乳白色 Opal	0.16	15	36	1巻 1 roll
TA－0011	ポリエステルフィルム Tape	黒 Black	0.06	10	30	1巻 1 roll
TA－0012	ポリエステルフィルム Tape	透明 Transparent	0.025	6	30	1巻 1 roll
TA－0013	アセテートクロス（シート） Tape (200x120/sheet)	黒 Black	0.23	20	200 (mm)	1set (20pcs)

リードワイヤー一覧表

LEAD WIRE LIST

DEC. 17. 1991

部品 No. Part No.	色 Color	外形 Diameter (outer tube)	導体サイズ Pcs. / Diameter (lead wire)	部品 No. Part No.	色 Color	外形 Diameter (outer tube)	導体サイズ Pcs. / Diameter (lead wire)
W−0045BN	Brown	0.45mm	7×0.05mm	W−0108BK	Black	1.08mm	7×0.16mm
W−0045RE	Red	-ditto-	-ditto-	W−0108BN	Brown	-ditto-	-ditto-
W−0045OR	Orange	-ditto-	-ditto-	W−0108RE	Red	-ditto-	-ditto-
W−0045GN	Green	-ditto-	-ditto-	W−0108OR	Orange	-ditto-	-ditto-
W−0045BE	Blue	-ditto-	-ditto-	W−0108YE	Yellow	-ditto-	-ditto-
W−0045PU	Purple	-ditto-	-ditto-	W−0108GN	Green	-ditto-	-ditto-
				W−0108BE	Blue	-ditto-	-ditto-
W−0056BK	Black	0.56mm	7×0.08mm	W−0108PU	Purple	-ditto-	-ditto-
W−0056BN	Brown	-ditto-	-ditto-	W−0108GY	Gray	-ditto-	-ditto-
W−0056RE	Red	-ditto-	-ditto-	W−0108WH	White	-ditto-	-ditto-
W−0056OR	Orange	-ditto-	-ditto-				
W−0056YE	Yellow	-ditto-	-ditto-	W−0120BK	Black	1.2 mm	7×0.18mm
W−0056GN	Green	-ditto-	-ditto-	W−0120BN	Brown	-ditto-	-ditto-
W−0056BE	Blue	-ditto-	-ditto-	W−0120RE	Red	-ditto-	-ditto-
W−0056PU	Purple	-ditto-	-ditto-	W−0120OR	Orange	-ditto-	-ditto-
W−0056GY	Gray	-ditto-	-ditto-	W−0120YE	Yellow	-ditto-	-ditto-
W−0056WH	White	-ditto-	-ditto-	W−0120GN	Green	-ditto-	-ditto-
W−0056PK	Pink	-ditto-	-ditto-	W−0120BE	Blue	-ditto-	-ditto-
				W−0120PU	Purple	-ditto-	-ditto-
				W−0120GY	Gray	-ditto-	-ditto-
				W−0120WH	White	-ditto-	-ditto-
W−0080BK	Black	0.80mm	7×0.12mm				
W−0080BN	Brown	-ditto-	-ditto-	W−0150BK	Black	1.5 mm	40×0.08mm
W−0080RE	Red	-ditto-	-ditto-	W−0150BN	Brown	-ditto-	-ditto-
W−0080OR	Orange	-ditto-	-ditto-	W−0150RE	Red	-ditto-	-ditto-
W−0080YE	Yellow	-ditto-	-ditto-	W−0150OR	Orange	-ditto-	-ditto-
W−0080GN	Green	-ditto-	-ditto-	W−0150YE	Yellow	-ditto-	-ditto-
W−0080BE	Blue	-ditto-	-ditto-	W−0150GN	Green	-ditto-	-ditto-
W−0080PU	Purple	-ditto-	-ditto-	W−0150BE	Blue	-ditto-	-ditto-
W−0080GY	Gray	-ditto-	-ditto-	W−0150PU	Purple	-ditto-	-ditto-
W−0080WH	White	-ditto-	-ditto-	W−0150GY	Gray	-ditto-	-ditto-
W−0080LB	Light blue	-ditto-	-ditto-	W−0150WH	White	-ditto-	-ditto-
1 roll=20m							

収縮チューブ一覧表

Thermal construction tube list

Dec. 17, 1991

部品 No. Part No.	名称 Name of part	直径 Diameter (φ)	長さ Length (m)	備考 Remaks
TU－0001	収縮チューブ Thermal construction tube	1.0mm	1	RP-8925
TU－0002	収縮チューブ Thermal construction tube	2.0mm	1	RP-8925
TU－0003	収縮チューブ Thermal construction tube	3.0mm	1	RP-8925
TU－0004	収縮チューブ Thermal construction tube	4.0mm	1	RP-8925

(5) 1K117-394
(1) 1K400-340
(5) 1K520-873
(1) 1G016-048-1
(1) 1B100-627
(1) 1G156-037
1K161-177 / 1K999-116 / 1K161-122 / 1K161-129 } (5) x0-1
(1) 1B535-166
(10) B1-17035FRx6
(5) 1B999-492
(1) 1K641-143
(1) 1K641-144
(10) T1-01500SXx135
(5) 1K521-159
(5) ~~1K347-010~~
(1) 1K641-138
(1) 1K470-090
(10) B1-17040FAx6

(10) 1K010-083x2
(5) 1B240-086
(5) 1K480-025
TA-0004
(10) A2-20035FB
(5) 1K087-412
(1) 1K630-784
(10) K2-14015FB
(10) G2-17030FA
(5) 1K240-615-1
(5) 1K208-082
(5) 1K681-444
(10) 1K611-704
(10) A3-20040FSx2
(10) K2-17030FB
(1) 1K260-606
(5) 1K601-166x2

(1) 1K641-141
(10) K2-14020FA
(5) 1K520-880-1
(5) 1B240-052-1
(5) 1K610-996
Tape
1K600-551 (5)
(5) 1K115-817
(10) B2-17028FAx2
(5) 1K110-373
(1) 1K630-786
(5) 1K115-817

(10) 1K126-067x2
(10) 1K130-328x2
1K116-450 / 1K116-453 } x2 (5)
1B002-013 (1)
1B240-051-2 (5)
(10) B1-17028FAx2
(1) 1K640-787-1
(1) 1K530-040-1
(10) 1K123-119x2

サービス課 M

Fig. 1

(5) 1K520-874
(1) 1G026-031
(1) 1K500-657
(1) 1G017-070
(10) 1K130-326x2
(5) 1K120-335x2
1K116-442 / 1K116-445 x2 } (5)
(5) 1K146-157x2
(10) 1K130-328x2
(1) 1B002-014
(10) H1-17030FSx2
(5) 1B240-053
(5) 1K208-094
(5) 1K610-997
(5) 1K240-549
(10) 1K120-219
(1) 1K475-485
(1) 1G024-016-1
(1) 1G213-025
(1) 1B100-432
(5) 1K520-875
1K116-661-1 / 1K116-663-1 x2 } (5)
1K116-450 / 1K116-453 x2 } (5)
(5) 1K240-416-1x2

A2-17060FBx3 (10)
(1) 1B999-491
(1) 1B100-433
(5) 1K520-876
1B570-013-2 (10)
(1) 1G015-034
(10) B1-17040FBx3
1B572-040 (5)
(5) 1K225-089
(10) 1K130-188-1
(5) 1B100-434-2
(5) 1K520-877
(1) 1G113-059
(5) 1K300-078
(5) 1K800-702x3
(10) B1-17025FAx6
(10) A1-20030FAx4
(10) A2-20035FB
(1) 1K641-142
(5) 1K880-801
(10) A1-17045FAx2
1K126-051
(5) 1K681-442
(10) B1-17028FAx2
(10) B1-17028FAx3
(5) 1K260-607
(10) S1-02000SX
(1) 1B002-016
(5) 1K277-131
(10) 1K811-706
(5) 1K230-377
(5) 1K277-132
(10) 1K120-021x2
(5) 1B600-065
(1) 1B999-395
(5) A2-17025FBx2
(5) 1K610-995
(5) 1B314-154
S1-02000SX (10)
(5) 1K230-240-2
(5) 1B610-060
(10) B1-17060FA
1K050-016 / 1K050-203 / 1K050-379 / 1K050-380 } (5)

(5) 1B314-153-1
(10) B1-20030FBx2
(10) 1K120-219x3
1K180-734 / 1K180-742 } (5)
(1) 1K641-139
(5) 1K208-097
(5) 1K240-583
(1) 1K475-486
(10) 1K120-088x2
(5) 1K610-993
(5) 1K180-683-1x2
(10) 1K010-002-1
(5) 1K010-089x2
(10) 1K120-254x3
(1) 1K404-078-5
(10) 1K120-010-1
(10) 1K010-002-1
(10) 1K010-002-1
(10) 1K120-012
(10) 1K120-361
1K240-020-1 / 1K240-021-1 / 1K240-188-1 / 1K240-790 } (5)
(10) 1K120-162x2
1K485-202 (1)
(1) 1B060-489
(1) 1K540-144

Fig. 2

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
*1K010-002-1	121	Screw	3		2, 3	○		10
*1K010-083	157	Screw	2		1, 3	○		10
*1K010-089	118	Screw	2		2, 3	○		5
*1K050-016	176	Washer	0-1		2, 3	○		10
*1K050-203	176	Washer	0-1		2, 3	○		10
*1K050-379	176	Washer	0-1		2, 3	○		5
*1K050-380	176	Washer	0-1		2, 3	○		5
1K087-412	98	銘板 Name plate	1		1, 3	○		5
1K110-373	37	ゴムリング Rubber ring	1		1, 3	○		5
*1K115-817	101	スエード Flock paper	2		1, 3	○		5
*1K116-442	132	ガイド環 Guide ring	0-2		2, 3	○		5
*1K116-443	132	ガイド環 Guide ring	0-2		2, 3	○		5
*1K116-444	132	ガイド環 Guide ring	0-2		2, 3	○		5
*1K116-445	132	ガイド環 Guide ring	0-2		2, 3	○		5
*1K116-450	134	ガイド環 Guide ring	0-4		1, 2 3	○		5
*1K116-451	134	ガイド環 Guide ring	0-4		1, 2 3	○		5
1K116-311	154	テープ Tape	1		1, 3	○	TA-0004	1 roll

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
*1K116-452	134	ガイド環 Guide ring	0-4		1, 2 3	○		5
*1K116-453	134	ガイド環 Guide ring	0-4		1, 2 3	○		5
*1K116-661-1	133	ガイド環 Guide ring	0-2		2, 3	○		5
*1K116-662-1	133	ガイド環 Guide ring	0-2		2, 3	○		5
*1K116-663-1	133	ガイド環 Guide ring	0-2		2, 3	○		5
1K117-394	44	保護ゴム Rubber ring	1		1, 3	○		5
*1K120-010-1	123	Screw	1		2, 3	○		10
*1K120-012	120	Screw	1		2, 3	○		10
*1K120-021	109	Screw	2		2, 4	○		10
*1K120-086	127	Screw	2		2, 3	○		10
*1K120-162	124	Screw	2		2, 3	○		10
*1K120-219	117	Screw	4		2, 3	○		10
*1K120-254	122	Screw	3		2, 3	○		10
*1K120-335	131	Screw	2		2, 3	○		5
1K120-361	119	Screw	1		2, 3	○		10
*1K123-119	143	Screw	2		1, 3	○		10

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
*1K126-051	126	Screw	2		2. 3	○		5
*1K126-067	142	Screw	2		1. 3	○		10
*1K130-188-1 (1K130-188)	73	Screw	1		2. 3	○		10
*1K130-326	128	Screw	2		2. 3	○		10
*1K130-328	130	Screw	4		1. 2 3	○		10
1K146-157	129	段付軸 Shaft	2		2. 3	○		5
*1K160-683-1	108	Washer	2		2. 3	○		5
*1K160-734	137	Washer t=0.5	0-1		2. 3	○		5
*1K160-735	137	Washer t=0.3	0-1		2. 3	○		5
*1K160-736	137	Washer t=0.2	0-1		2. 3	○		5
*1K160-737	137	Washer t=0.1	0-1		2. 3	○		5
*1K160-738	137	Washer t=0.09	0-1		2. 3	○		5
*1K160-739	137	Washer t=0.08	0-1		2. 3	○		5
*1K160-740	137	Washer t=0.07	0-1		2. 3	○		5
*1K160-741	137	Washer t=0.06	0-1		2. 3	○		5
*1K160-742	137	Washer t=0.05	0-1		2. 3	○		5

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
1K161-177	190	Washer	1		1, 3	○		5
*1K206-082	95	レバー Lever	1		1, 3	○		5
*1K208-094	147	マクロボタン Macro button	1		2, 3	○		5
*1K208-097	65	ロック釦 Lock button	1		2, 3	○		5
*1K225-089	72	引張バネ Spring	1		2, 3	○		5
*1K230-240-2 (1K230-240)	162	バネ Spring	1		2, 4	○		5
1K230-377	164	バネ Spring	1		2, 3	○		5
*1K240-020-1 (1K240-020)	36	クリックバネ t=0.2 Click spring	0-1		2, 3	○		5
*1K240-021-1 (1K240-021)	36	クリックバネ t=0.18 Click spring	0-1		2, 3	○		5
*1K240-188-1 (1K240-188)	36	クリックバネ t=0.22 Click spring	0-1		2, 3	○		5
*1K240-416-1 (1K240-416)	188	板バネ Leaf spring	2		2, 3	○		5
*1K240-549	149	板バネ Leaf spring	1		2, 3	○		5
*1K240-563	66	EE ロックバネ EE lock spring	1		2, 3	○		5
*1K240-615-1 (1K240-615)	99	クリックバネ Click spring	1		1, 3	○		5
*1K240-790	36	クリックバネ t=0.15 Click spring	0-1		2, 3	○		5
1K260-606	58	丸環 Ring	1		1, 3	○		1

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
1K260-607	83	クラッチギァー Gear	1		2. 4	○		5
1K277-131	84	平歯車 Gear	1		2. 4	○		5
1K277-132	85	平歯車 Gear	1		2. 4	○		5
*1K300-078	21	絞りカム Cam	1		2. 3	○		5
1K347-016	106	Washer	1		1. 3	○		5
1K400-340	38	フィルター環 Filter ring	1		1. 3	○		1
*1K404-078-5	30	バヨネット Bayonet mount	1		2. 4	○		1
1K470-090	27	距離環 Focus ring	1		1. 3	○		1
1K475-485	26	深度環 Depth of field ring	1		2. 3	○		1
*1K480-025	153	アクリル板 Acryle plate	1		1. 3	○		5
1K475-486	28	絞り環 Diaphragm ring	1		2. 3	○		1
1K485-202	64	指標環 Index ring	1		2. 3	○		1
*1K500-657	42	2群レンズ室 2nd lens housing	1		2. 3	○		1
*1K520-873	40	G1 押さえ環 G1 retaining ring	1		1. 3	○		5
*1K520-874	43	G4-G8 押さえ環 G2-G8 retaining ring	1		2. 3	○		5
*1K520-875	47	G10. G11 押さえ環 G10. G11 retaining ring	1		2. 3	○		5

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
*1K520-876	50	G13. G14 押さえ環 G13. G14 retaining ring	1		2. 3	○		5
*1K520-877	54	G16 押さえ環 G16 retaining ring	1		2. 3	○		5
*1K520-880-1	61	押さえ環 retaining ring	1		1. 3	○		5
1K521-159	105	丸環 Ring	1		1. 3	○		5
*1K530-040-1 (1K530-040)	140	リード溝環 Inner tube	1		1. 3	○		1
*1K540-144	39	鏡筒 Rear cover ring	1		2. 3	○		1
*1K600-551	114	穴カバー Plate	1		1. 3	○		5
*1K600-702	146	平板 Plate	3		2. 3	○		5
1K601-166	187	平板 Plate	2		1. 3	○		5
*1K610-993	78	絞り連動カバー Actuating plate	1		2. 3	○		5
*1K610-995	92	軸受け Shaft holder	1		2. 4	○		5
*1K610-996	94	止め板 Snap plate	1		1. 3	○		5
*1K610-997	93	ナット Nut	1		2. 3	○		5
1K611-704	96	曲げ板 Bent plate	1		1. 3	○		10
1K611-706	163	曲げ板 Bent plate	1		2. 3	○		10
1K630-784	51	丸筒 Tube	1		1. 3	○		1

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
1K630-786	60	丸筒 Tube	1		1. 3	○		1
*1K640-767-1 (1K640-767)	141	丸環 Ring	1		1. 3	○		1
1K641-138	22	丸筒 Tube	1		1. 3	○		1
1K641-139	29	丸筒 Tube	1		2. 3	○		1
1K641-141	59	丸筒 Tube	1		1. 3	○		1
1K641-142	82	丸筒 Tube	1		2. 4	○		1
1K641-143	100	丸環 Ring	1		1. 3	○		1
1K641-144	104	丸環 Ring	1		1. 3	○		1
*1K680-801	148	連結コマ Connecting plate	1		2. 3	○		5
1K681-442	77	ブロック Block	1		2. 4	○		5
1K681-444	91	ブロック Block	1		1. 3	○		5
*1G113-059	G16	G16 レンズ G16 lens element	1		2. 3	○		1
△ *1G156-037	G3	G3 レンズ G3 lens element	1	1B100-627	1. 3	○△ ↓ △	RP-9507	
*1G213-025	G8	G8 レンズ G8 lens element	1		2. 3	○		1

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部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
*A1-17045FA	182	Screw	2		2. 3	○		10
*A1-20030FA	150	Screw	4		2. 3	○		10
*A2-17025FB	174	Screw	2		2. 4	○		10
*A2-17060FB	161	Screw	3		2. 3	○		10
*A2-20035FB	167	Screw	2		1. 2 3	○		10
*A3-20040FS	172	Screw	2		1. 3	○		10
*B1-17025FA	115	Screw	6		2. 3	○		10
*B1-17028FA	111	Screw	7		1. 2 4	○		10
*B1-17035FR	103	Screw	6		1. 3	○		10
*B1-17040FA	113	Screw	6		1. 3	○		10
*B1-17040FB	110	Screw	3		2. 3	○		10
*B1-17060FA	181	Screw	1		2. 3	○		10
*B1-20030FB	125	Screw	2		2. 3	○		10
*B2-17028FA	173	Screw	2		1. 3	○		10
*G2-17030FA	171	Screw	1		1. 3	○		10
*H1-17030FS	175	Screw	2		2. 3	○		10

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部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
*K2-14015FB	168	Screw	1		1. 3	○		10
*K2-14020FA	186	Screw	1		1. 3	○		10
*K2-17030FB	169	Screw	1		1. 3	○		10
*S1-02000SX	179	Screw	2		2. 4	○		10
*T1-01500SX	107	鋼球 Steel ball	135		1. 3	○	93F-1021	10

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部組品表 Assembly List

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	部組番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	構成組品番号 Constituent Parts	参照図番 Fig. No.	備考 Remarks	要求単位 Q'ty per order
	1B002-013	B56	リード環 組 Inner tube	1	1K530-062 1K630-785	1		1
	1B002-014	B55	ヘリコイド 組 Helicoid unit	1	1K307-026 1K540-146-3 1K630-783	2		1
	1B002-016	B159	レバー 組 Lever unit	1	1K260-608 1K371-704 X 2 1K426-003 1K601-164	2		1
△	1B060-489	B81	FPC 組 * FPC unit	1	1K116-533 1K116-824 1K117-395 1K240-469-1 X 5 1K680-643-1 1K680-651-2 1S015-059	2	RP-9561	1
△	1B060-489-2							
	*1B100-432	Z46	G9 レンズ室組 G9 Lens housing unit	1	1G114-074 1K500-658	2		1
	*1B100-433	Z49	G12 レンズ室組 G12 Lens housing unit	1	1G154-070 1K500-659	2		1
	*1B100-434-3 (1B100-434)	Z53	G15 レンズ室組 G15 Lens housing unit	1	1G247-045 1K500-660	2		5
	1B100-627	Z41	G3 レンズ室組 G3 Lens housing unit	1	1G156-037 1K500-830	1		1
	*1B240-051-2 (1B240-051)	B63	ブラシ 組 Brush unit	1	1K240-453-2 1K680-790-1	1		5
	*1B240-052-2 (1B240-052)	B97	インサート スイッチ Swicth	1	1K240-547-1	1		5
	*1B240-053	B151	ブラシ 組 Brush unit	1	1K240-550 1K680-802	2		5
	1B240-086	B112	ブラシ 組 Brush unit	1	1K240-797 1K681-443	1		5
	*1B314-153-2 (1B314-153)	B23	シーソーレバー 組 Lever unit	1	1K314-311-1 1K340-143 1K371-098 1K610-992	2		5

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部組品表 Assembly List

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部組番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	構成組品番号 Constituent Parts	参照図番 Fig. No.	備考 Remarks	要求単位 Q'ty per order
*1B314-154	B155	スイッチレバー組 Lever unit	1	1K314-312 1K370-117	2		5
1B535-166	B24	ヘリコイド 組 Helicoid unit	1	1K535-408 1K535-409	1		1
*1B570-013-2 (1B570-013)	B32	絞り羽根 Diaphragm blade	9	1K370-004-1 X 2 1K570-012	2		10
*1B572-040	B71	矢車 組 Blade actuating ring	1	1K370-933 1K572-124	2		5
1B600-065	B90	ギア軸受 Gear shaft holder	1	1K371-705 1K601-165	2		5
1B610-060	B158	クラッチ Clutch	1	1K371-108 1K611-012	2		5
*1B999-395	B160	クラッチギアー 組 Clutch gear unit	1	1K136-067-1 1K260-349-3 1K426-002	2		1
1B999-491	B75	羽根基板 組 Blade mount unit	1	1K370-052 1K574-151 1K641-140 1K680-688	2		1
1B999-492	B139	ガイド軸 Guide ring	0-1	1K117-396 1K130-494	1		5
1B999-493	B139	ガイド軸 Guide ring	0-1	1K117-397 1K130-494	1		5
1B999-494	B139	ガイド軸 Guide ring	0-1	1K117-398 1K130-494	1		5
1B999-495	B139	ガイド軸 Guide ring	0-1	1K117-399 1K130-494	1		5

部組品表 Assembly List

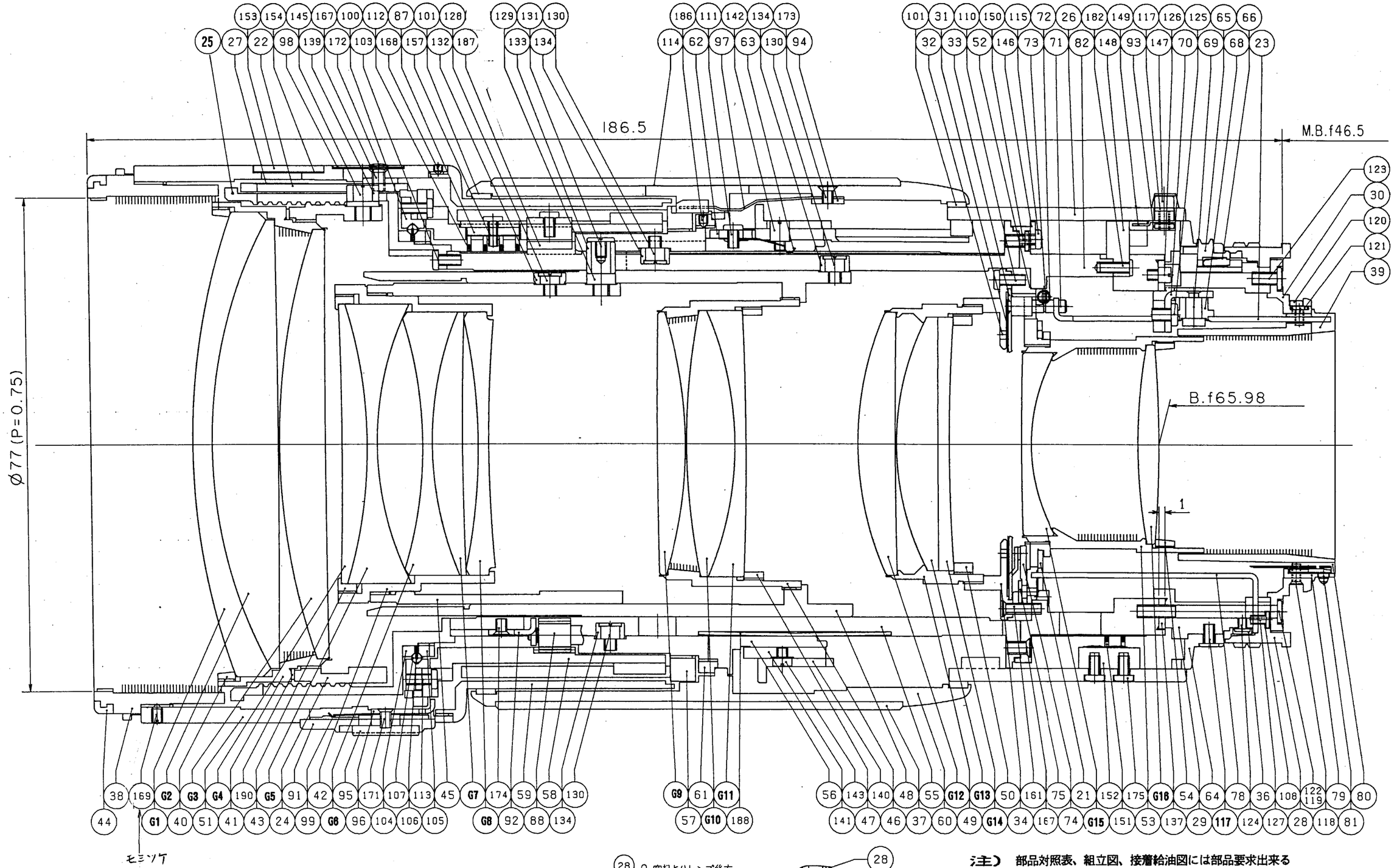
JAA74251-R. 3299. A

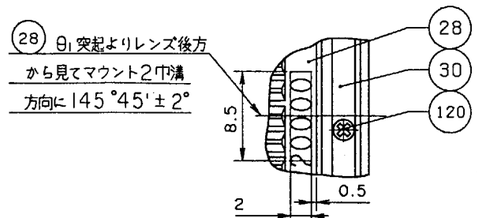
部組番号 Part No.	補助番号 Ckt No.	名称 Name	1台分個数 Pcs. Per Unit	構成組品番号 Constituent Parts	参照図番 Fig. No.	備考 Remarks	要求単位 Q'ty per order
*1G015-034	L5	G13. G14 レンズ G13. G14 Lens element	1	1G153-044 1G257-049	2		1
*1G016-048-1 (1G016-048)	L1	G1. G2 レンズ GI. G2 Lens element	1	1G114-073-1 1G157-048	1		1
*1G017-070	L4	G10. G11 レンズ G10. G11 Lens element	1	1G111-037 1G252-027	2		1
*1G024-016-1 (1G024-016)	L2	G4. G5 レンズ G4. G5 Lens element	1	1G154-069 1G210-026-1	2		1
*1G026-031	L3	G6. G7 レンズ G6. G7 Lens element	1	1G152-045 1G210-027	2		1

〔3〕 部品対照表 Parts Reference Table

補助番号 Auxiliary No.	部品番号 Part Number	補助番号 Auxiliary No.	部品番号 Part Number	補助番号 Auxiliary No.	部品番号 Part Number
G1	1G257-048	40	1K520-873	79	1K680-643-1
G2	1G114-073-1	41	1K500-830	80	1K680-651-1
G3	1G156-037	42	1K500-657	81	1K240-469-1
G4	1G154-069	43	1K520-874	82	1K641-142
G5	1G210-026-1	44	1K117-394	83	1K260-607
G6	1G210-027	45	1K630-783	84	1K277-131
G7	1G152-045	46	1K500-658	85	1K277-132
G8	1G213-025	47	1K520-875	86	1K260-608
G9	1G114-074	48	1K540-146-3	87	1K681-443
G10	1G111-037	49	1K500-659	88	1K260-349-3
G11	1G252-027	50	1K520-876	89	1K601-164
G12	1G154-070	51	1K630-784	90	1K601-165
G13	1G153-044	52	1K641-140	91	1K681-444
G14	1G257-049	53	1K500-660-1	92	1K610-995
G15	1G247-045	54	1K520-877	93	1K610-997
G16	1G113-059	55	1K307-026	94	1K610-996
		56	1K530-062	95	1K206-082
21	1K300-078	57	1K630-785	96	1K611-704
22	1K641-138	58	1K260-606	97	1K240-547-1
23	1K314-311-1	59	1K641-141	98	K087-412
24	1K535-408	60	1K630-786	99	1K240-615-1
25	1K535-409	61	1K520-880-1	100	1K641-143
26	1K475-485	62	1K680-790-1	101	1K115-817
27	1K470-090	63	1K240-453-2	102	1K117-395
28	1K475-486	64	1K485-202	103	B1-17035FR
29	1K641-139	65	1K208-097	104	1K641-144
30	1K404-078-5	66	1K240-563	105	1K521-159
31	1K570-012			106	1K347-016
32	1K370-004-2	68	1K340-143	107	T1-01500SX
33	1K572-124	69	1K371-098	108	1K160-683-1
34	1K574-151	70	1K610-992	109	1K120-021
		71	1K370-933	110	B1-17040FB
36	1K240-020-1	72	1K225-089	111	B1-17028FA
	1K240-021-1	73	1K130-188-1	112	1K240-797
	1K240-188-1	74	1K680-688	113	B1-17040FA
	1K240-790	75	1K370-052	114	1K600-551
37	1K110-373	76	1K371-704	115	B1-17025FA
38	1K400-340	77	1K681-442	117	1K120-219
39	1K540-144	78	1K610-993	118	1K010-089

補助番号 Auxiliary No.	部品番号 Part Number	補助番号 Auxiliary No.	部品番号号 Part Number	補助番号 Auxiliary No.	部品番号 Part Number
119	1K120-361	145	1K130-494	185	1K116-533
120	1K120-012	146	1K600-702	186	K2-14020FA
121	1K010-002-1	147	1K208-094	187	1K601-166
122	1K120-254	148	1K680-801	188	1K240-416-1
123	1K120-010-1	149	1K240-549	190	1K161-177
124	1K120-162	150	A1-20030FA		
125	B1-20030FB	151	1K240-550	B23	1B314-153-1
126	1K126-051	152	1K680-802	B24	1B535-166
127	1K120-086	153	1K480-025	B32	1B570-013-2
128	1K130-326	154	1K116-311	B55	1B002-014
129	1K146-157	155	1K314-312	B56	1B002-013
130	1K130-328	156	1K611-012	B63	1B240-051-2
131	1K120-335	157	1K010-083	B71	1B572-040
132	1K116-442	158	1K371-108	B75	1B999-491
	1K116-443	159	1K426-003	B81	1B060-489
	1K116-444	160	1K136-067-1	B90	1B600-065
	1K116-445	161	A2-17060FB	B97	1B240-052-1
133	1K116-661-1	162	1K230-240-2	B112	1B240-086
133	1K116-662-1	163	1K611-706	B139	1B999-492
133	1K116-663-1	164	1K230-377	B151	1B240-053
134	1K116-450	165	1K426-002	B155	1B314-154
134	1K116-451	166	1K371-705	B158	1B610-060
134	1K116-452	167	A2-20035FB	B159	1B002-016
134	1K116-453	168	K2-14015FB	B160	1B999-395
137	1K160-734	169	K2-17030FB		
137	1K160-735			Z41	1B100-627
137	1K160-736	171	G2-17030FA	Z46	1B100-432
137	1K160-737	172	A3-20040FS	Z49	1B100-433
137	1K160-738	173	B2-17028FA	Z53	1B100-434-2
137	1K160-739	174	A2-17025FB		
137	1K160-740	175	H1-17030FS	L1	1G016-048-1
137	1K160-741	176	1K050-016	L2	1G024-016-1
137	1K160-742	176	1K050-203	L3	1G026-031
139	1K117-396	176	1K050-379	L4	1G017-070
139	1K117-397	176	1K050-380	L5	1G015-034
139	1K117-398	179	S1-02000SX		
139	1K117-399	180	1K370-117		
140	1K530-040-1	181	B1-17060FA		
141	1K640-767-1	182	A1-17045FA		
142	1K126-067	183	1K116-824		
143	1K123-119	184	1K116-533		





Note) When ordering the repair parts, please use the parts numbers stated on the Repair Parts Lost. Please note that some of those numbers stated on the Parts Number Reference Table, the Exploded Drawings and the Lubricant and Binding Agent Chart are not included in the Repair Parts List since they are not available as the individula repair parts

注) 部品対照表、組立図、接着給油図には部品要求出来る番号と要求出来ない番号と記載されています。
部品要求の際は、部品表で確認の上、要求して下さい。
部品表に記載されていない部番は部品要求出来ません。

Fig. 3

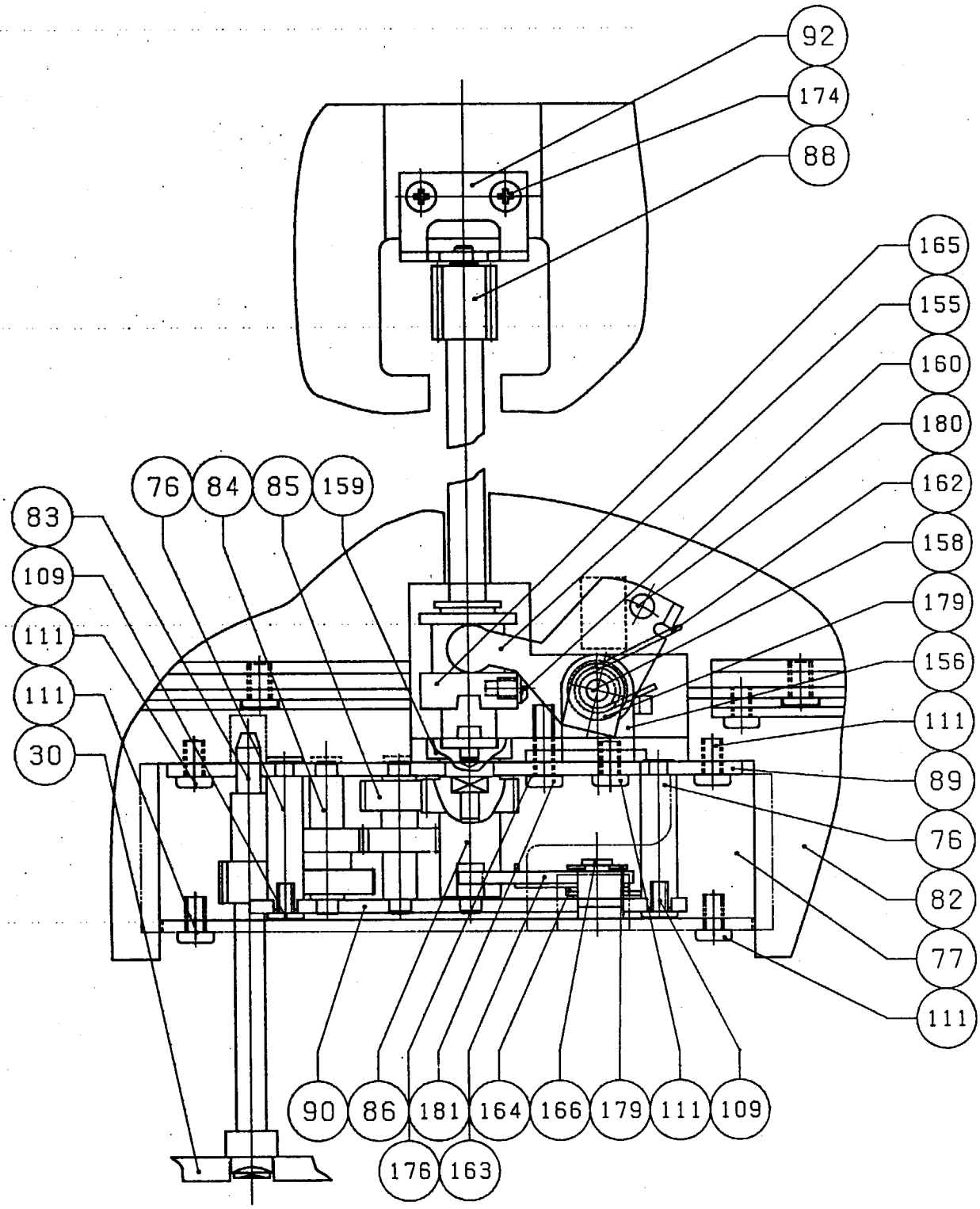
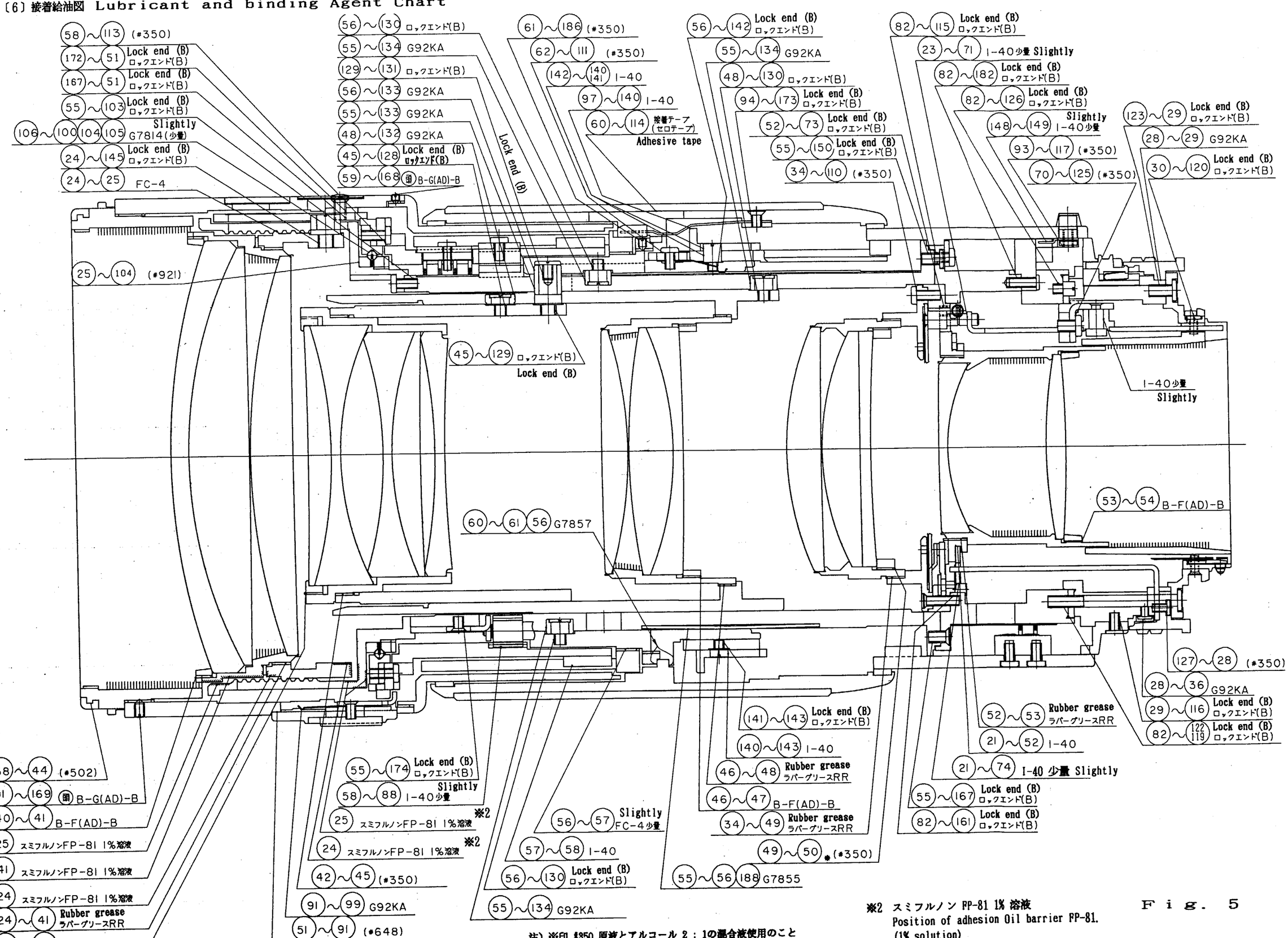

92
174
88
165
155
160
180
162
158
179
156
111
89
76
82
77
111
76
84
85
159
83
109
111
111
30
90
86
181
164
166
179
111
109
176
163

Fig. 4

〔6〕接着給油図 Lubricant and binding Agent Chart



※2 スミフルノン FP-81 1% 溶液
Position of adhesion Oil barrier FP-81.
(1% solution)

注) ※印 #350 原液とアルコール 2：1の混合液使用のこと

Fig. 5

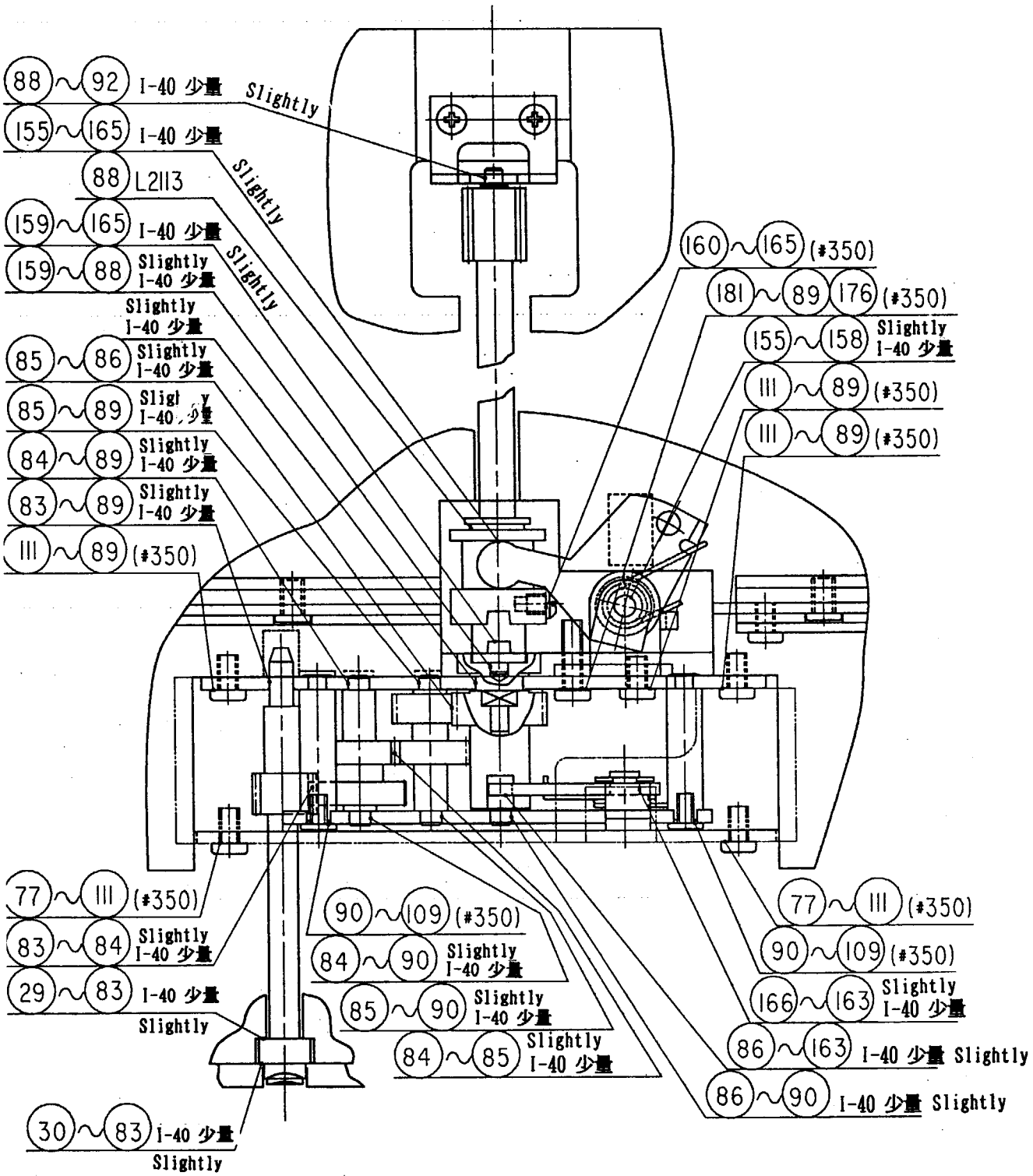
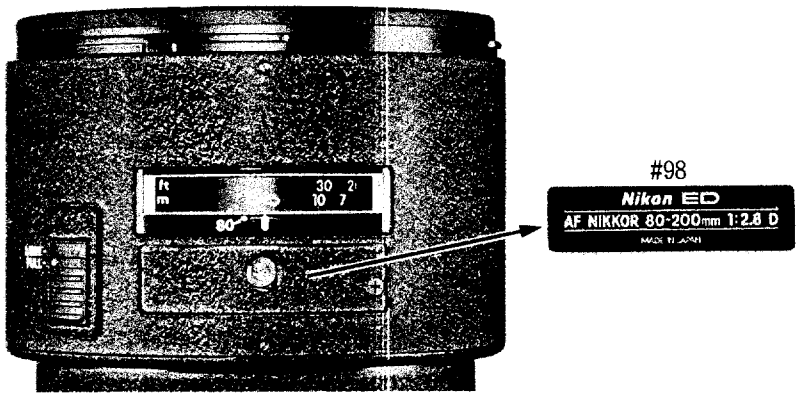

88 ~ 92 I-40 少量 Slightly
155 ~ 165 I-40 少量 Slightly
88 L2113
159 ~ 165 I-40 少量 Slightly
159 ~ 88 Slightly I-40 少量
Slightly I-40 少量
85 ~ 86 Slightly I-40 少量
85 ~ 89 Slightly I-40 少量
84 ~ 89 Slightly I-40 少量
83 ~ 89 Slightly I-40 少量
111 ~ 89 (#350)
160 ~ 165 (#350)
181 ~ 89 176 (#350)
155 ~ 158 Slightly I-40 少量
111 ~ 89 (#350)
111 ~ 89 (#350)
77 ~ 111 (#350)
83 ~ 84 Slightly I-40 少量
29 ~ 83 I-40 少量 Slightly
30 ~ 83 I-40 少量 Slightly
90 ~ 109 (#350)
84 ~ 90 Slightly I-40 少量
85 ~ 90 Slightly I-40 少量
84 ~ 85 Slightly I-40 少量
77 ~ 111 (#350)
90 ~ 109 (#350)
166 ~ 163 Slightly I-40 少量
86 ~ 163 I-40 少量 Slightly
86 ~ 90 I-40 少量 Slightly

Fig. 6

〔6〕 DISASSEMBLING／ASSEMBLING Parts.

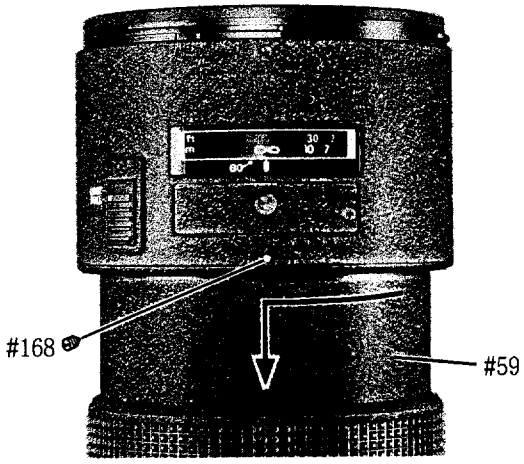
1. DISASSEMBLING

NAME PLATE #98

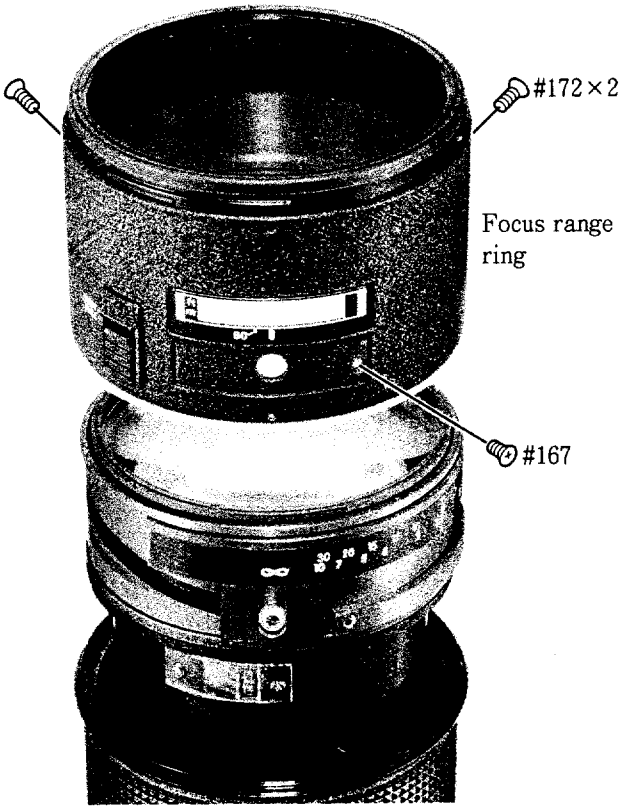


FOCUS RANGE RING

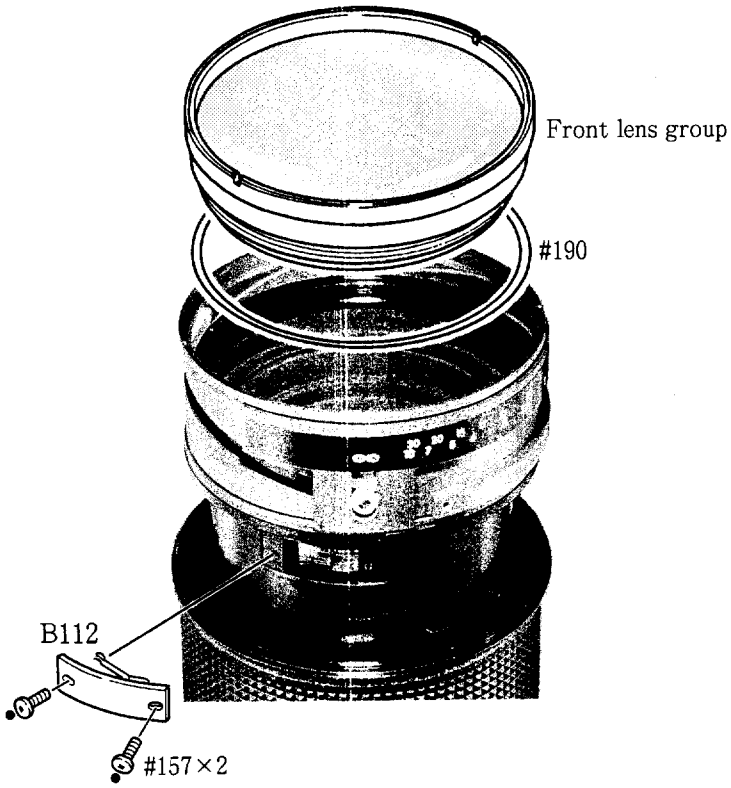
- Remove set screw #168 and remove external ring #59 from the focus range ring.



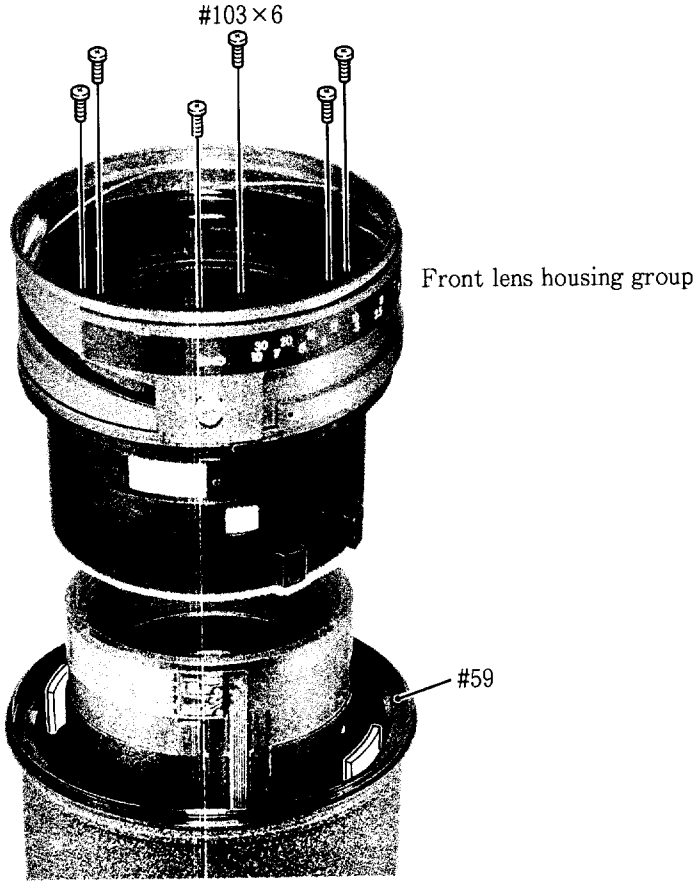
- Set the index to the ∞ (infinity) mark and remove the focus range ring.



FRONT LENS GROUP, DISTANCE BRUSH

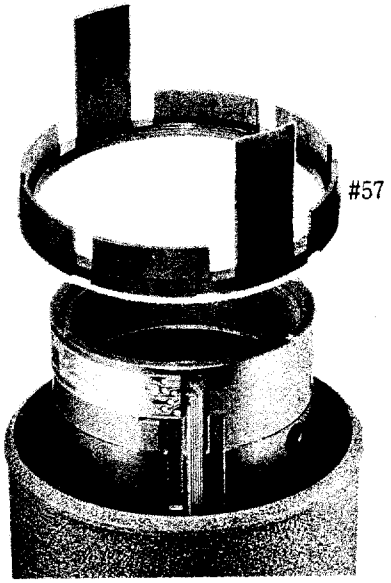


FRONT LENS HOUSING GROUP, EXTERNAL RING #59



2nd LENS GROUP

MANUAL FOCUS DRIVING RING #57

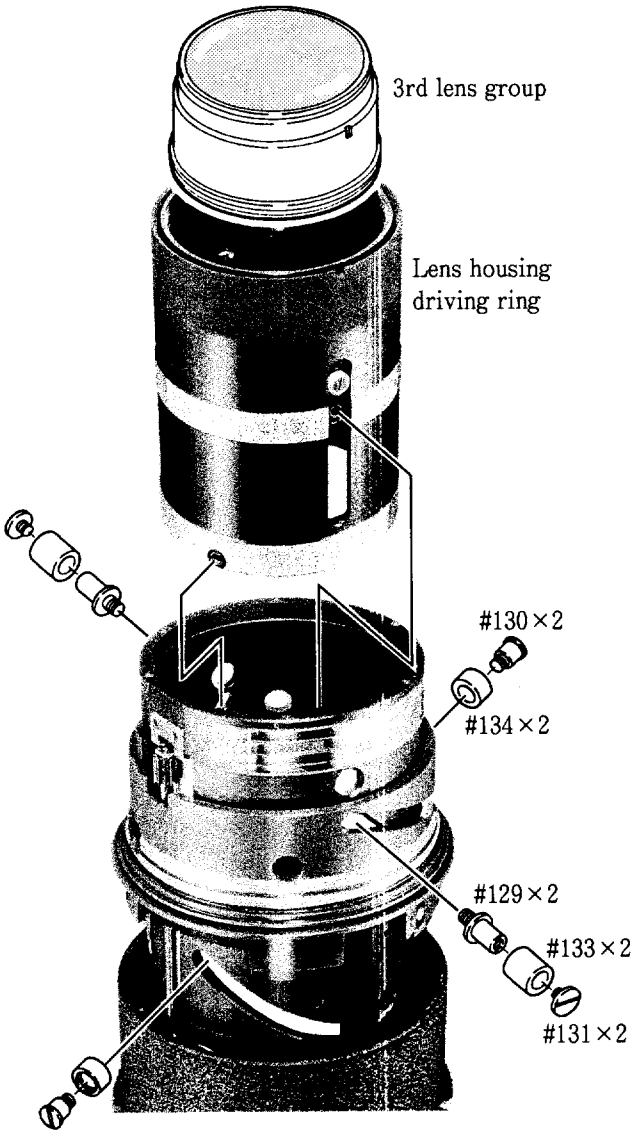


- Set the A-M ring to "A". Then remove the manual focus driving ring #57.

ZOOM／FOCIS RING

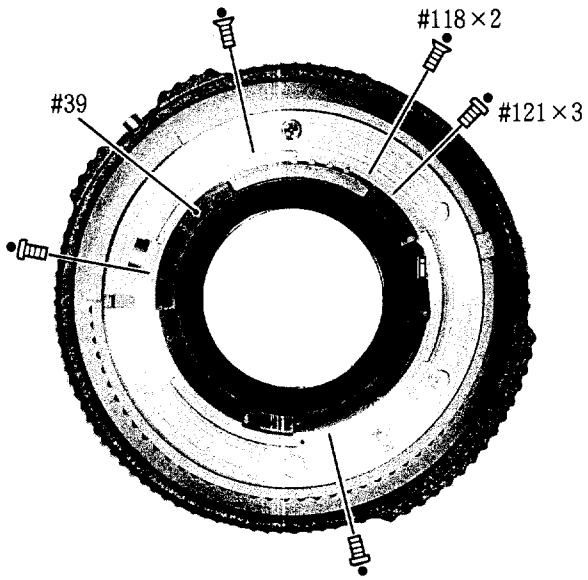
① Remove the rubber ring #37.
② Remove screw #186 from the hole in the zoom/focus ring.
③ Remove the retaining ring #61 using tool J11201.
④ Remove the zoom/focus ring.

LENS HOUSING DRIVING RING, 3rd LENS GROUP

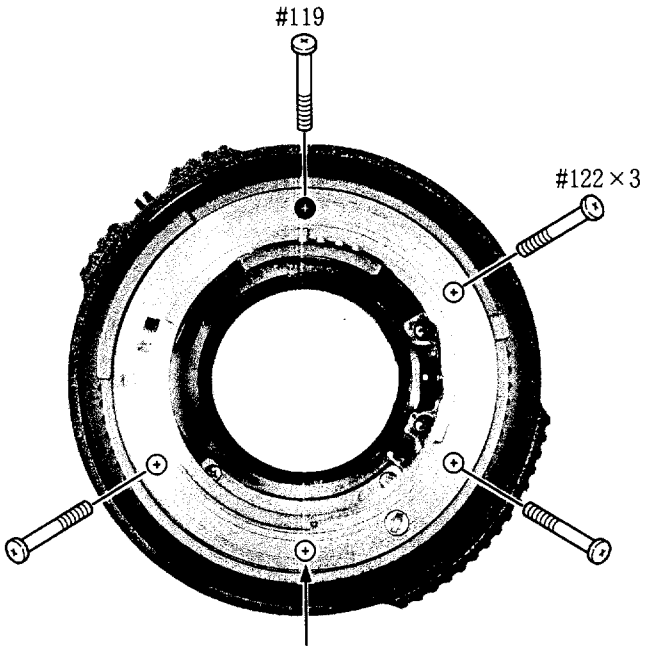


● Use tool J11195A to remove the 3rd lens group.

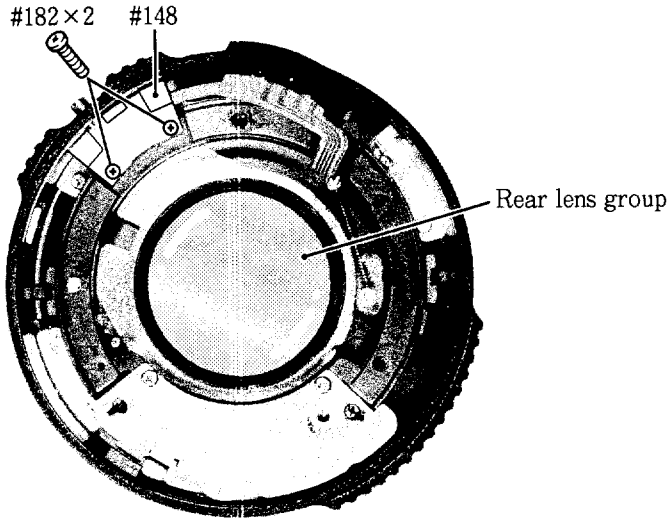
REAR COVER RING #39



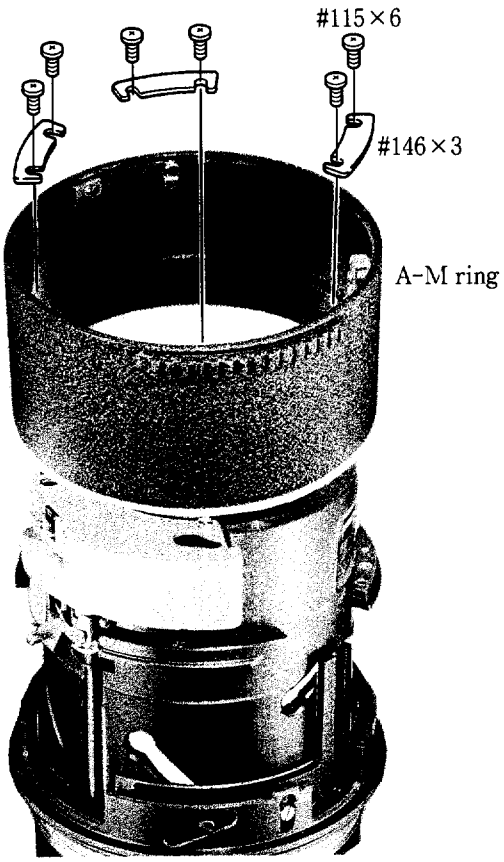
BAYONET MOUNT GROUP



REAR LENS GROUP, A－M BLOCK #148

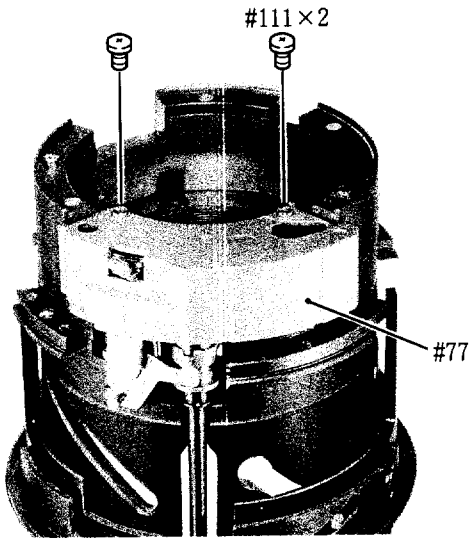


A－M RING

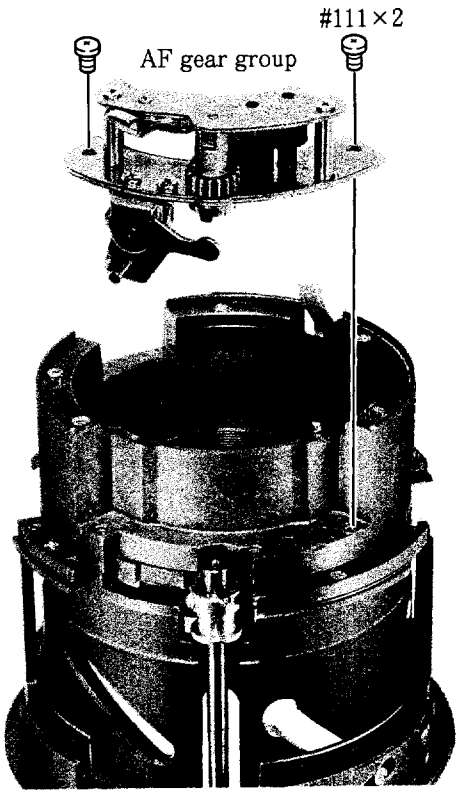


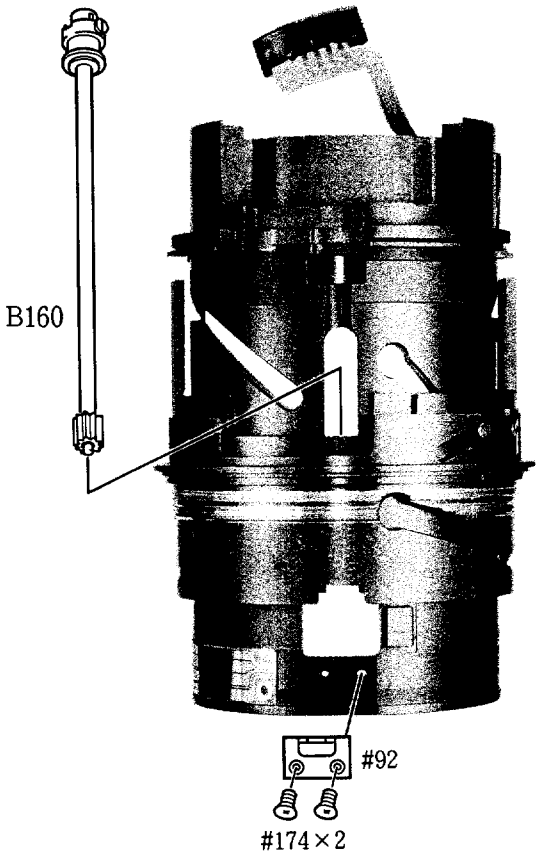
Note: Be sure not to bend the A-M brush.

GEAR COVER #77

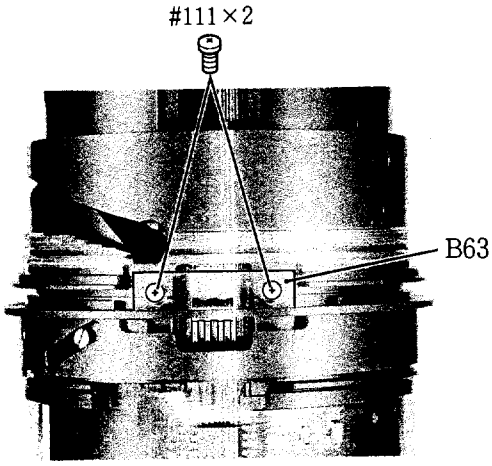


AF GEAR GROUP

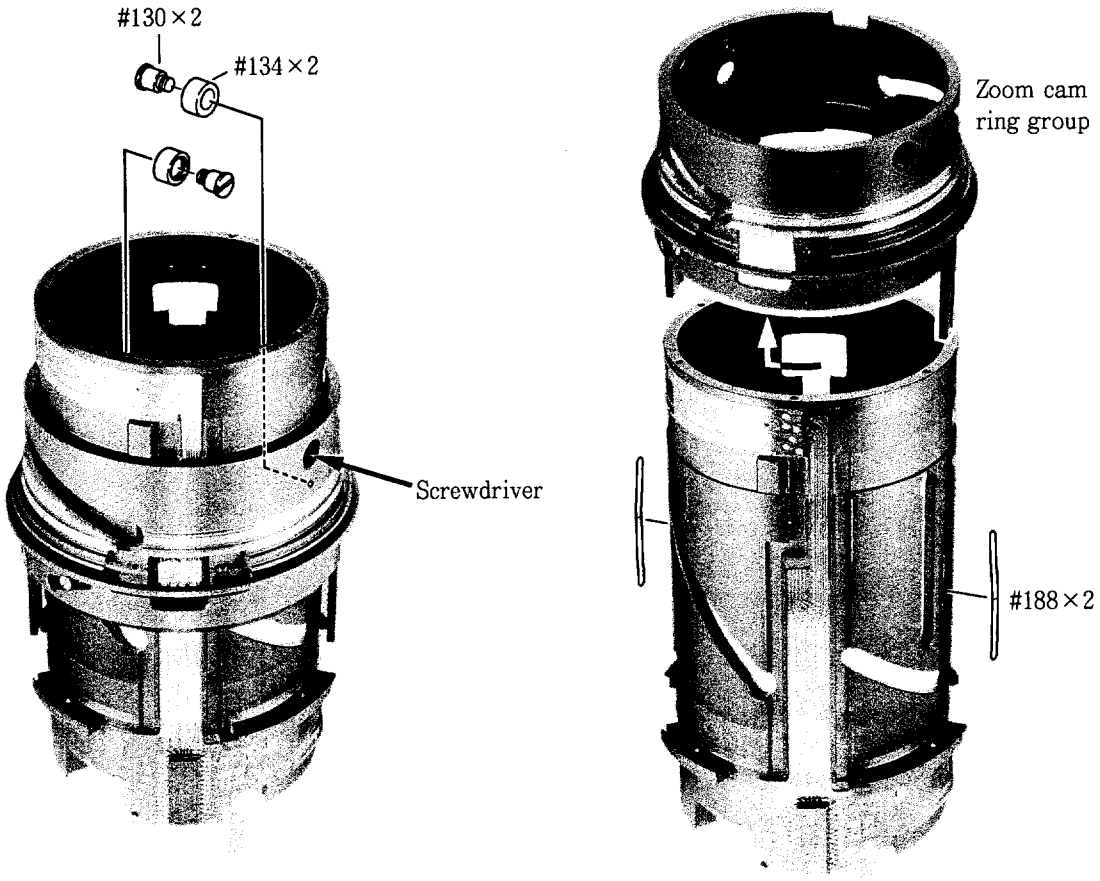




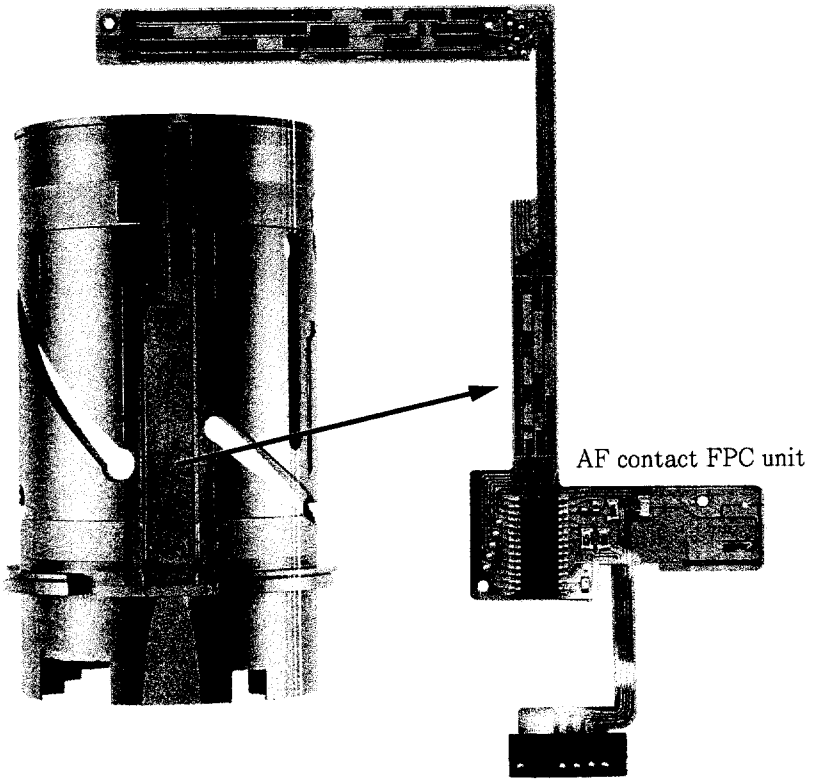
ZOOM BRUSH B63



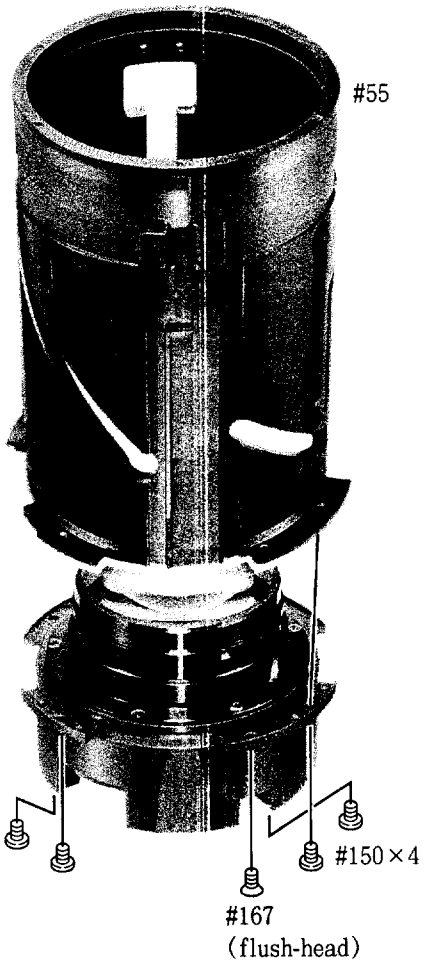
ZOOM CAM RING GROUP



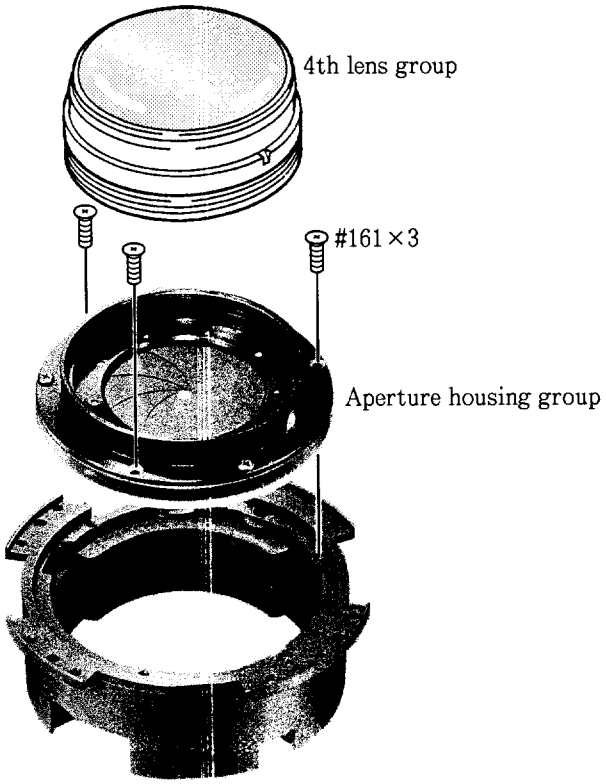
AF CONTACT FPC UNIT



LENS BARREL #55



4th LENS GROUP, APERTURE HOUSING GROUP

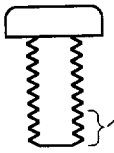


2. ASSEMBLING

◆ Before assembling

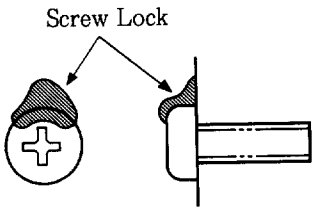
- Refer to the following figures when applying Lock End B or Screw Lock #350 agent (used to prevent screws from working loose).

Lock End B



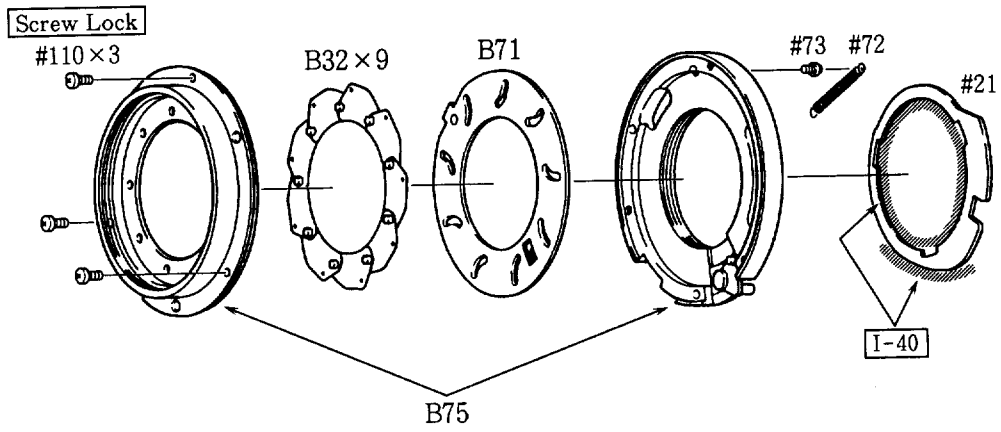
Apply agent to 2 or 3 threads of the screw's tip.

Screw Lock



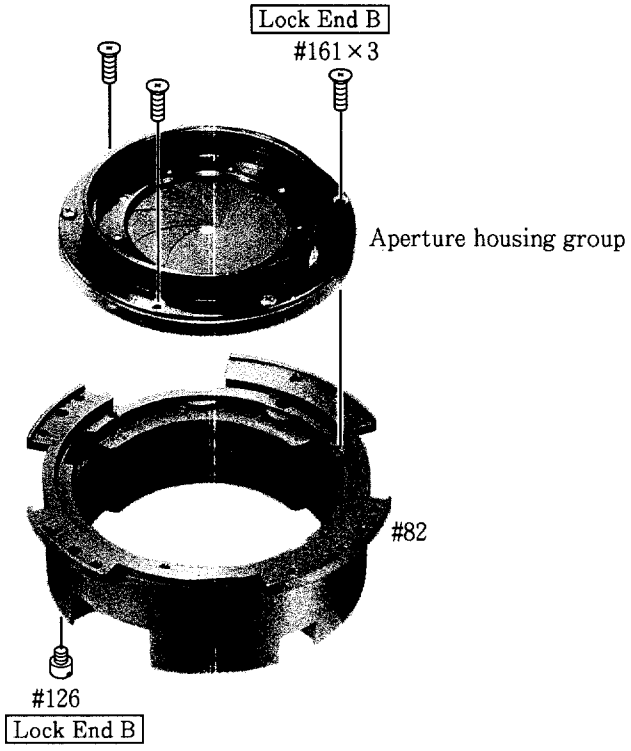
- If it is hard to obtain Lock End B locally, you can use Lock Tight (purple) instead. Make sure not to use the more powerful yellow, red or blue Lock Tight or you will not be able to remove the screw again easily.
- Remove all traces of old Lock End B or Screw Lock agent before reapplying.

APERTURE HOUSING GROUP

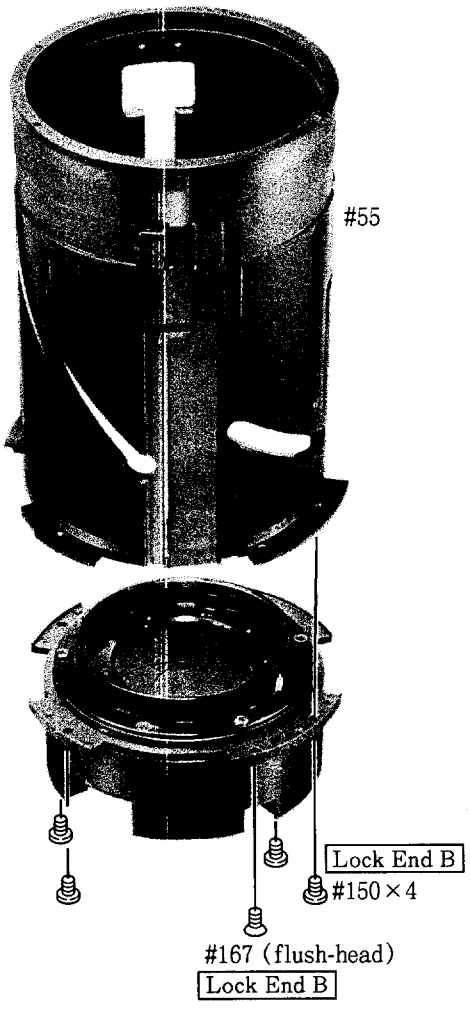


Inspection: Check aperture operation by moving the #21 and B71.

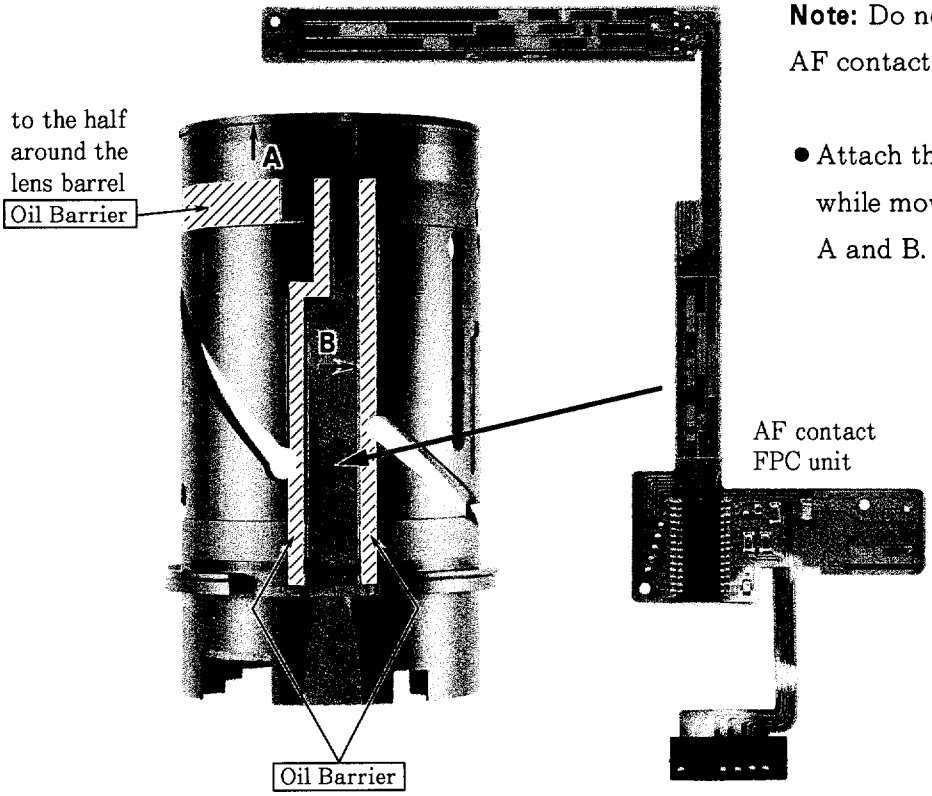
MOUNT THE APERTURE HOUSING GROUP



LENS BARREL #55



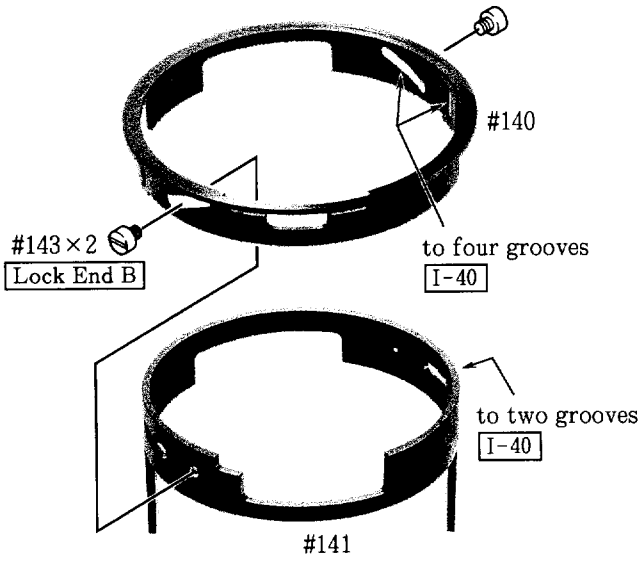
AF CONTACT FPC UNIT



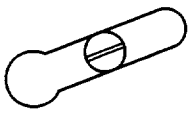
Note: Do not reuse the peeled-off AF contact FPC unit .

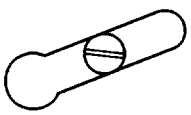
- Attach the AF contact FPC unit while moving it toward portions A and B.

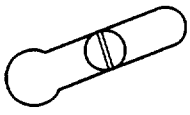
CAM RING #140 & #141



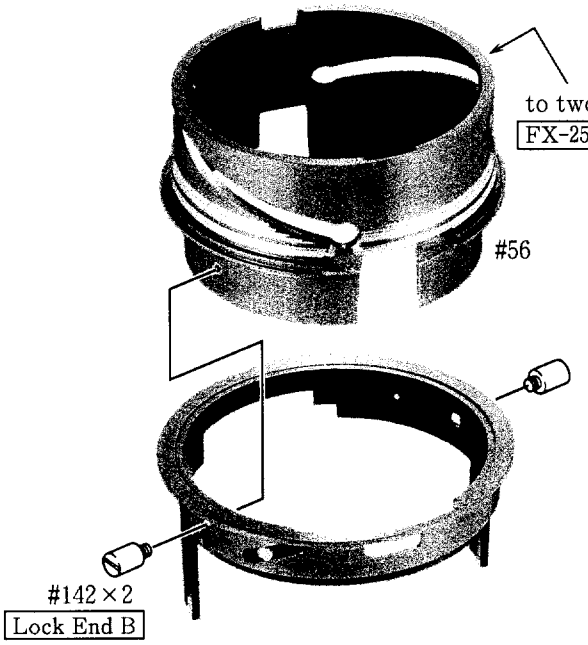
- The slot position of guide screw #143 for the groove should be as shown in the following figures.


Very good

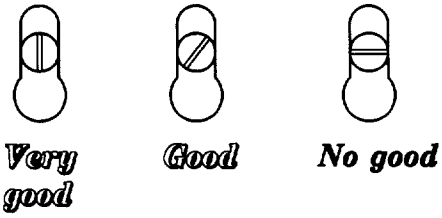

Good


No good

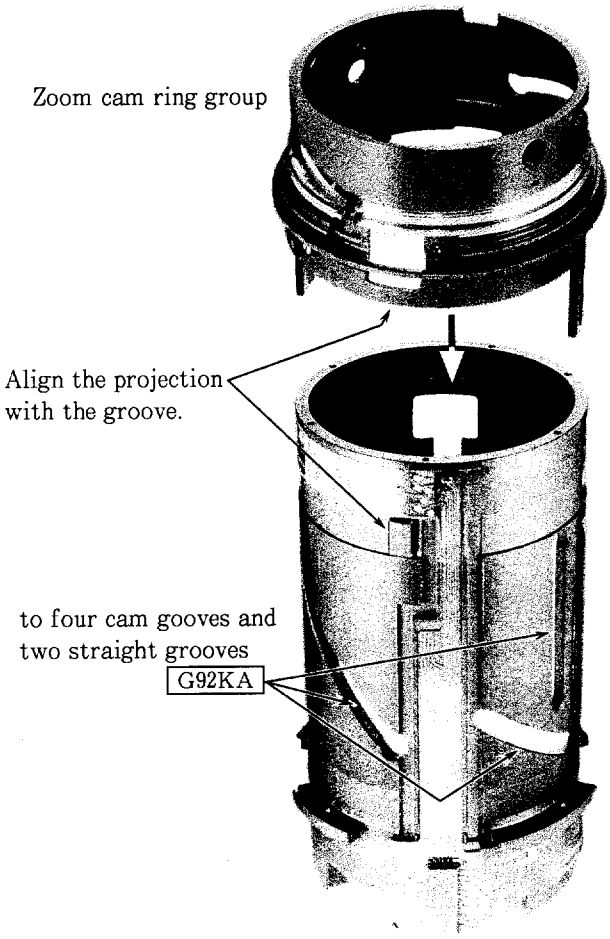
ZOOM CAM RING #56



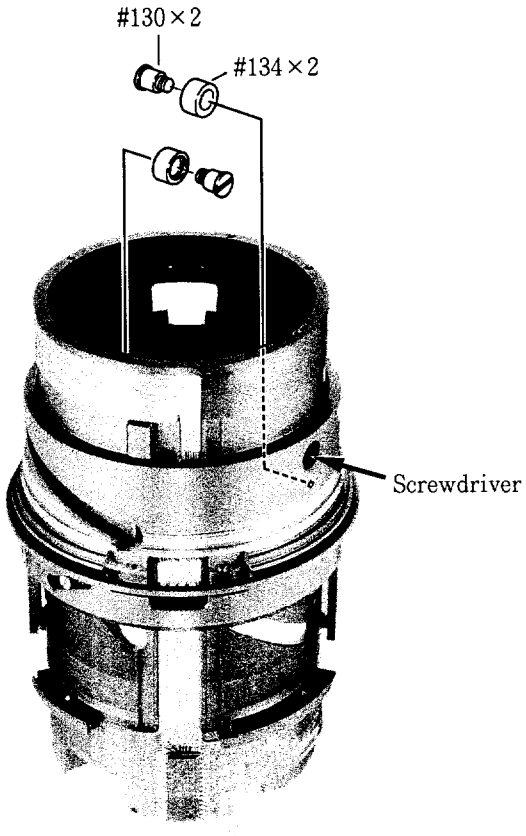
- The slot position of guide screw #142 for the groove should be as shown in the following figures.



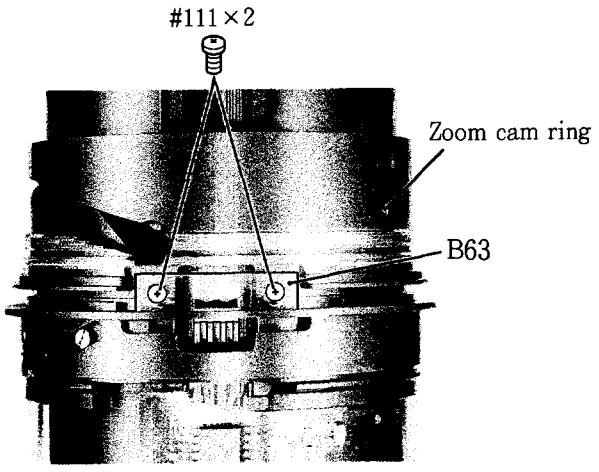
ASSEMBLE THE ZOOM CAM RING GROUP



Inspection: Move the zoom cam ring group vertically to check operation.



ZOOM BRUSH B63



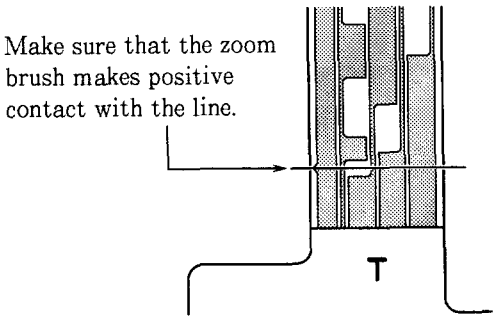
● Adjustment of zoom brush position

① Move the zoom cam ring until it comes to a stop at the stopper on the Tele (f=200) side.

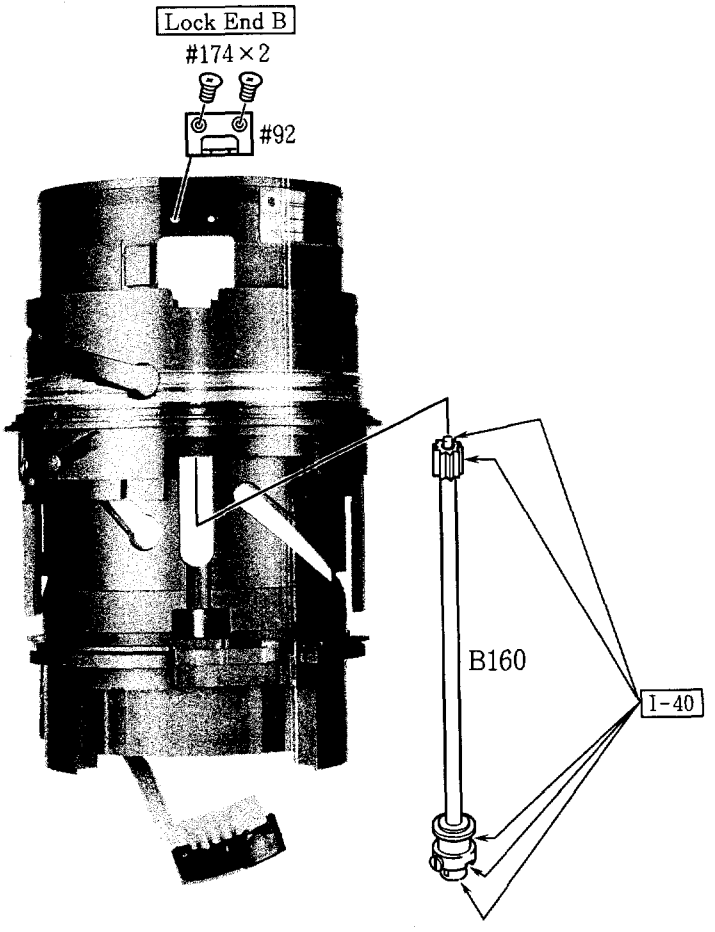
② Adjust the position of the zoom brush B63 so that the zoom brush comes into contact with the line as shown in the figure below.

③ Move the zoom cam ring vertically several times to check that the brush is correctly positioned.

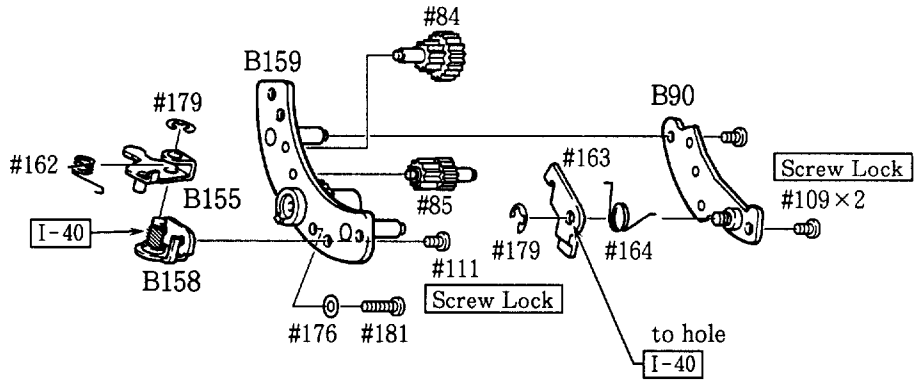
④ Secure screws #111×2 using Screw Lock.



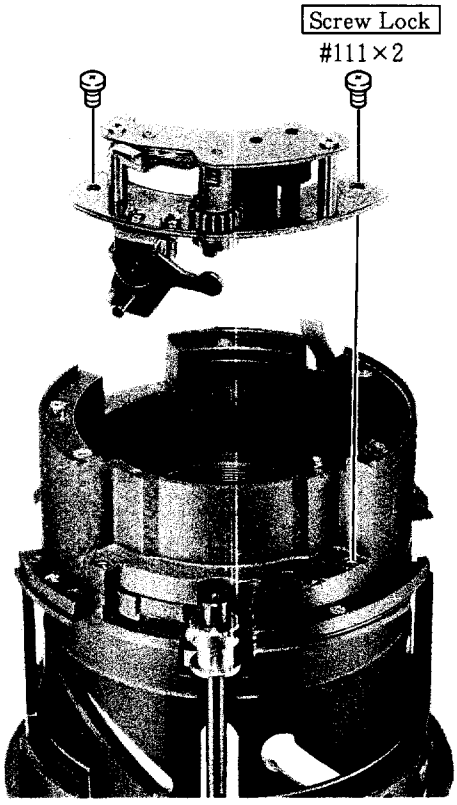
CLUTCH GEAR UNIT B160

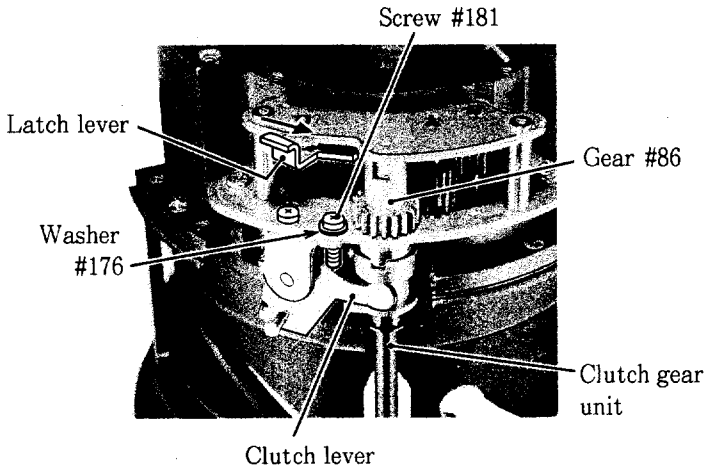


AF GEAR GROUP



● Apply grease I-40 to each gear and gear shaft.





● Adjust the position of the clutch lever

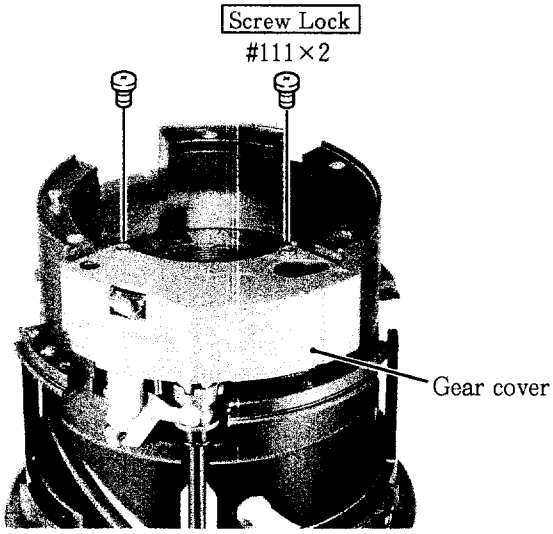
① Move the latch lever in the direction of the arrow. And rotate gear #86 or clutch gear unit to check operation.

② If operation is abnormal, change the thickness of washer #176 to adjust the position of clutch lever.

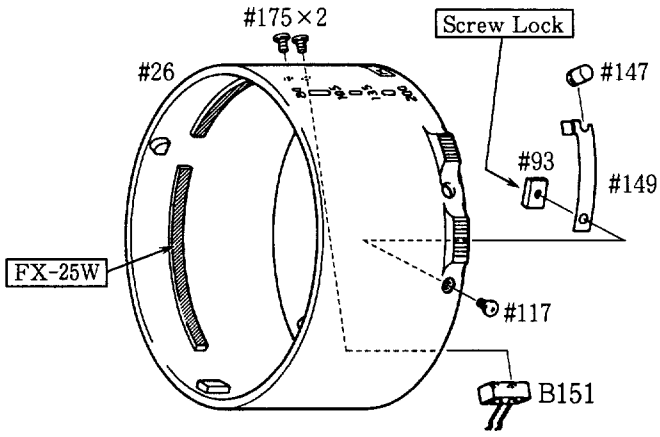
Note: Make sure that gear #86 and clutch gear unit are positively interlocked.

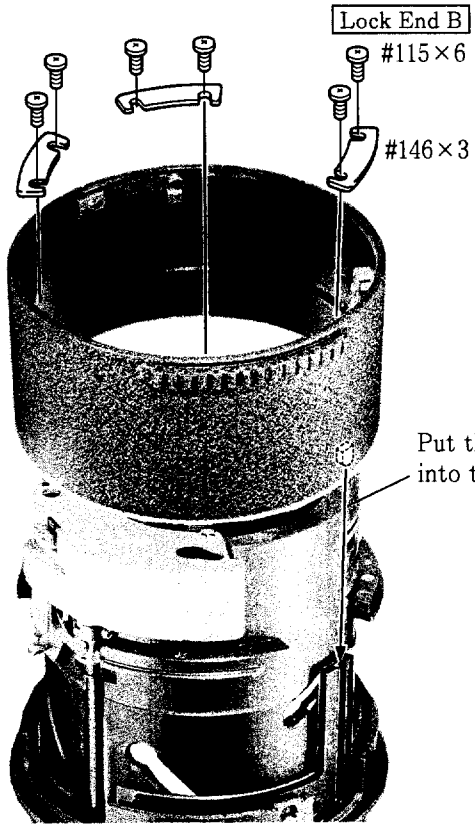
③ Secure screw #181 using Screw Lock.

GEAR COVER #77



A－M RING #26





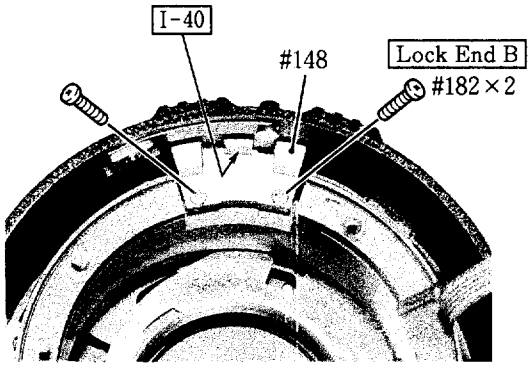
Note:

① Do not bend brush B151 when installing the A-M ring.

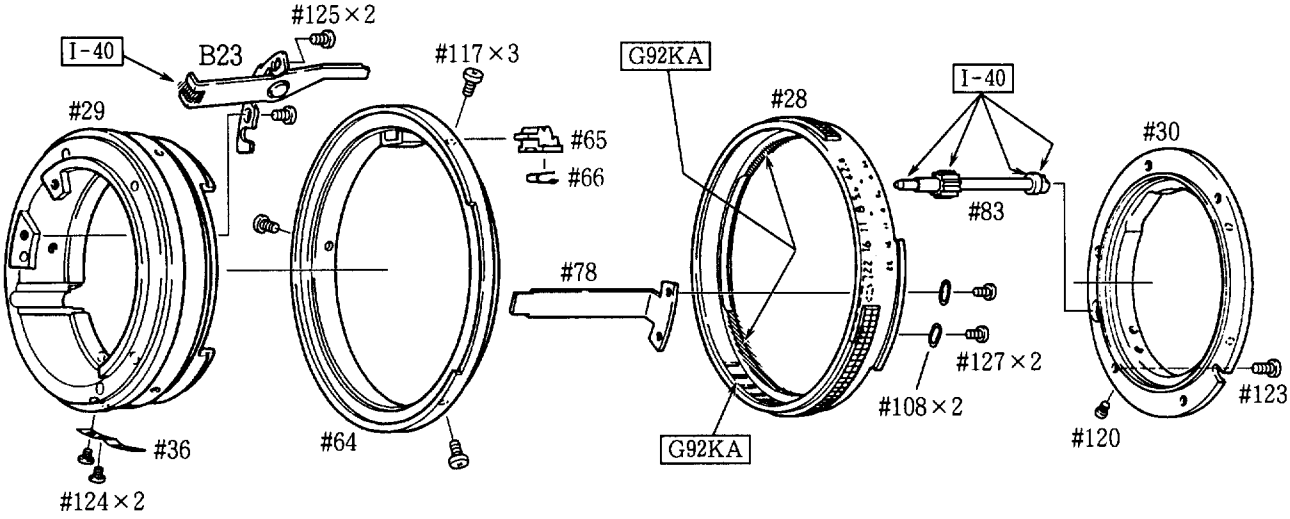
② Install retaining plates #146×3 with the flash surface facing upward.

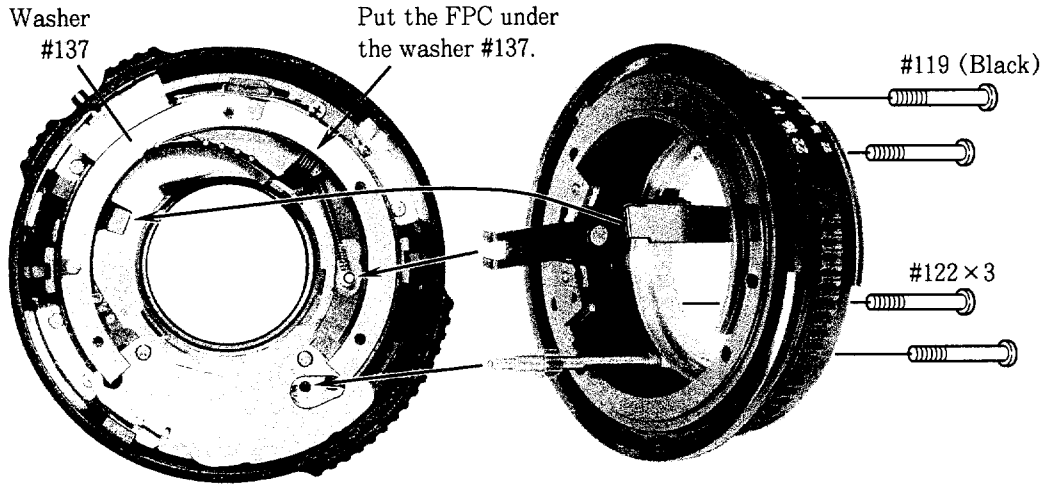
Inspection: Rotate the A-M ring to check operation and A-M changeover operation.

A－M BLOCK #148



BAYONET MOUNT GROUP





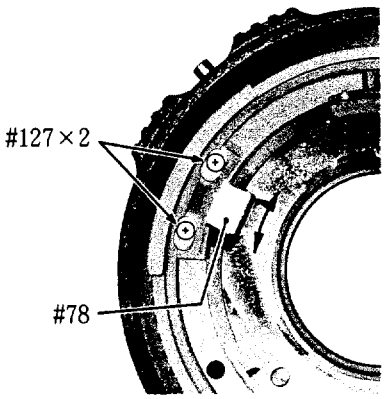
Note: If several #137 washers are to be used, insert thin washers between thick ones.

Inspection:

① Check operation of aperture by moving aperture lever and aperture ring.

② After setting the A-M ring to "A", rotate coupling gear #83 to check operation of AF gear section.

ADJUSTMENT OF APERTURE OPENING



Aperture setting	Inscribed circle diameter (mm)	Toleance (mm)
2.8	28.98	30.49 ~ 27.48
4	19.57	21.14 ~ 18.12
5.6	13.62	15.29 ~ 12.13
8	9.56	10.73 ~ 8.52
11	6.74	7.86 ~ 5.78
16	4.76	5.55 ~ 4.08
22	3.36	3.92 ~ 2.88

① Remove the bayonet mount #30 only.

② Unfasten the screws #127×2 and adjust the aperture diameter by moving the lever #78.

Reference:

(a) In the full aperture (f/2.8), let the aperture diameter be slightly larger than the inside diameter of B71 (28.5mm).

(b) In the minimum aperture (f/22), the 3mm-rod should pass through the aperture diameter and the 4mm-rod should not pass through it.

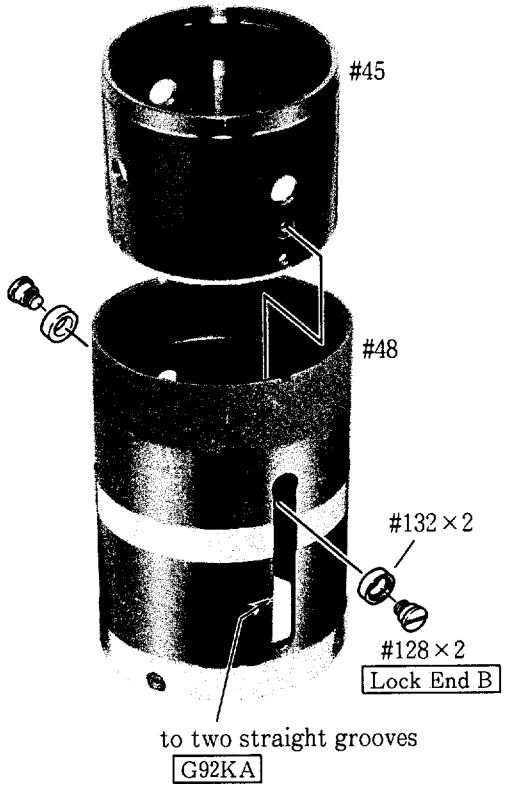
Inspection:

(a) Check to see that the aperture diameter stays within allowable range when the aperture ring is moved forward and backward.

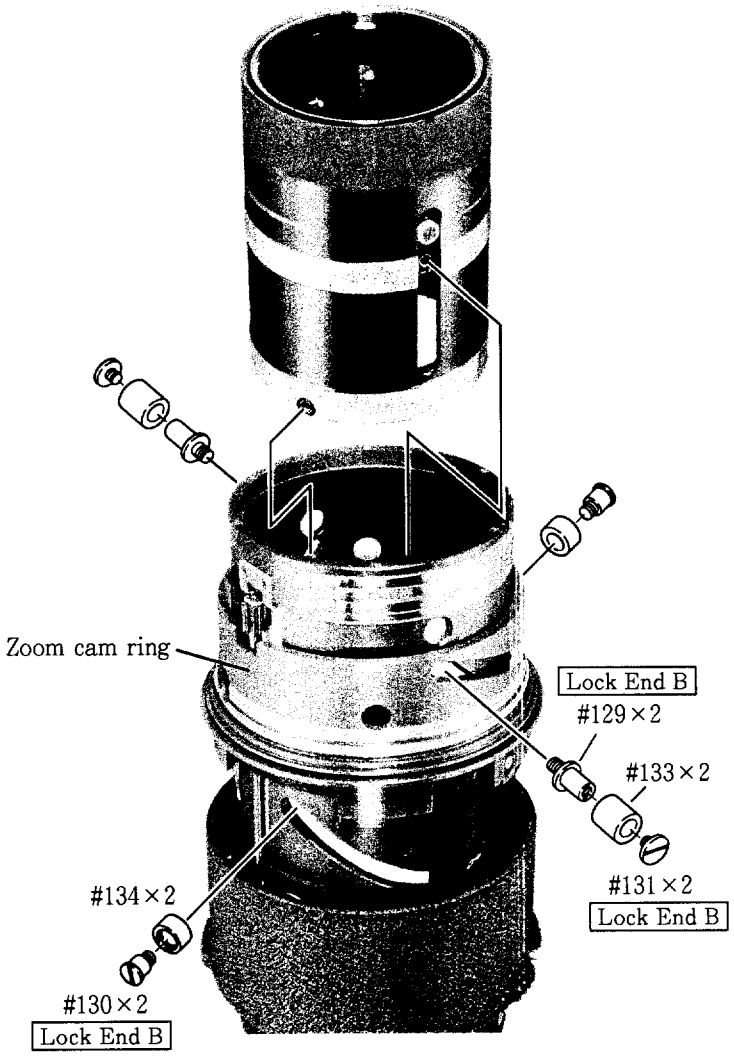
(b) Check to see that the aperture diameter stays within allowable range when the aperture lever is 'snapped', (using your finger), or when not 'snapped'.

③ After adjustment, secure screws #127×2 using Screw Lock.

LENS HOUSING DRIVIN RING #45 & #48

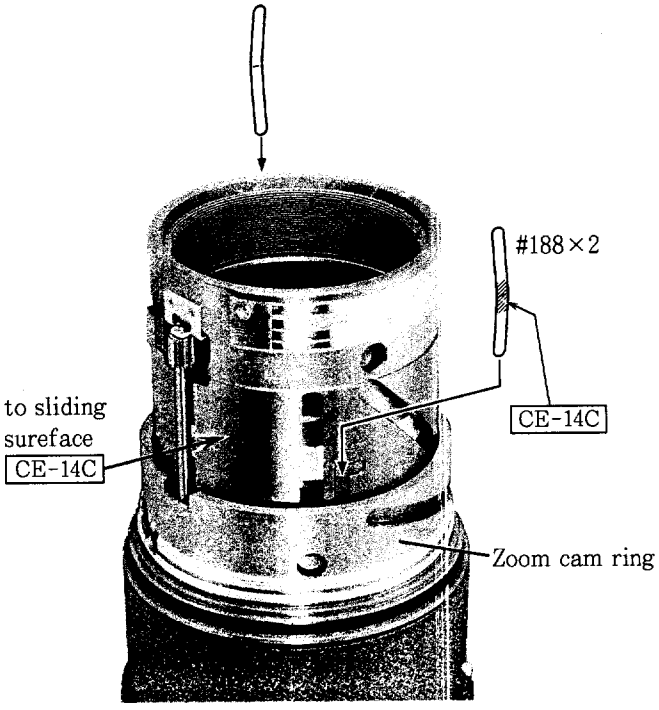


- Insert #45 into #48 and attach the guide rings at the optimum operating position.



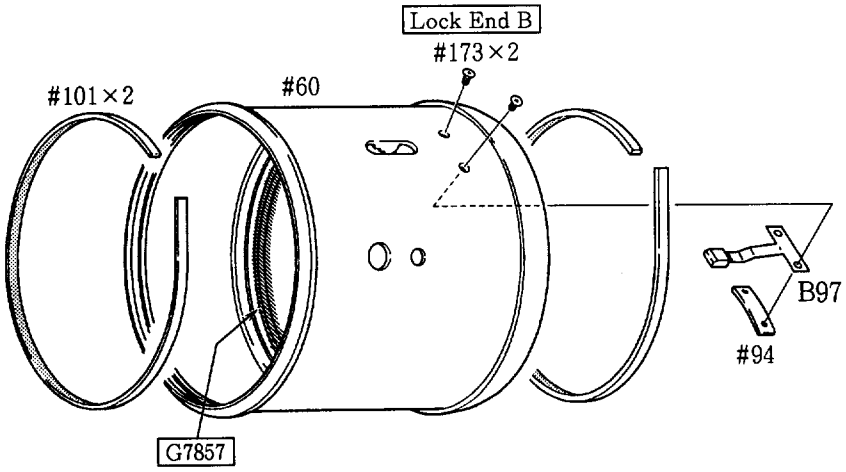
● Attach guide rings #130 and #134 in the first place. Then attach guide rings #129, #131, and #133 from the top of the zoom cam ring.

Inspection: Move the zoom cam ring vertically to check operation.



Inspection: Move the zoom cam ring vertically to check operation.

ZOOM／FOCUS RING #60



＊Be sure to make a mark the set screw using a ϕ1.1 drill.

△1 ×1

△1

● Use tool J11201 to mount retaining ring #61.

Note: There are two screw holes in the retaining ring #61. Insert one set screw into the screw hole in the ring in the portion other than "A".

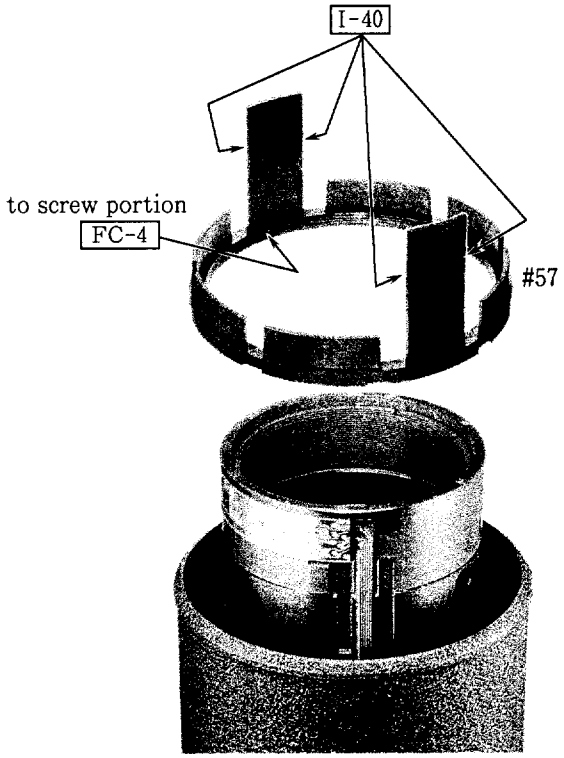
Inspection: Move the zoom/focus ring to check operation.

サービス課 M

Feb. 28 1994

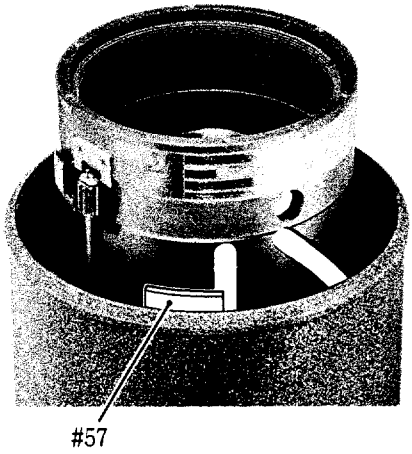
Change page (差し替え)

MANUAL FOCUS DRIVING RING #57



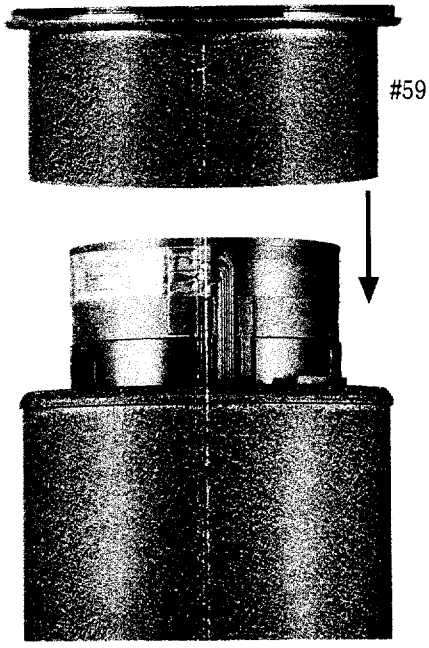
① Set the A-M ring to "A".

② Lightly screw in #57 as far as it will go. Rotate the ring by approximately 270° (3/4 turn) reversely so that #57 comes to the position as shown in the picture below.



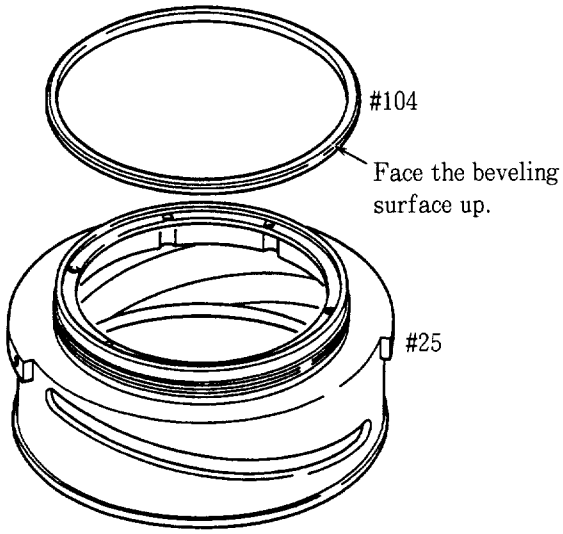
Note: Do not move #57 from the position as shown above until the front lens housing group has been mounted.

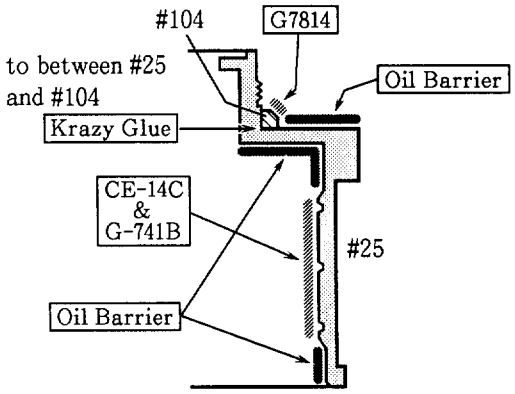
EXTERNAL RING #59

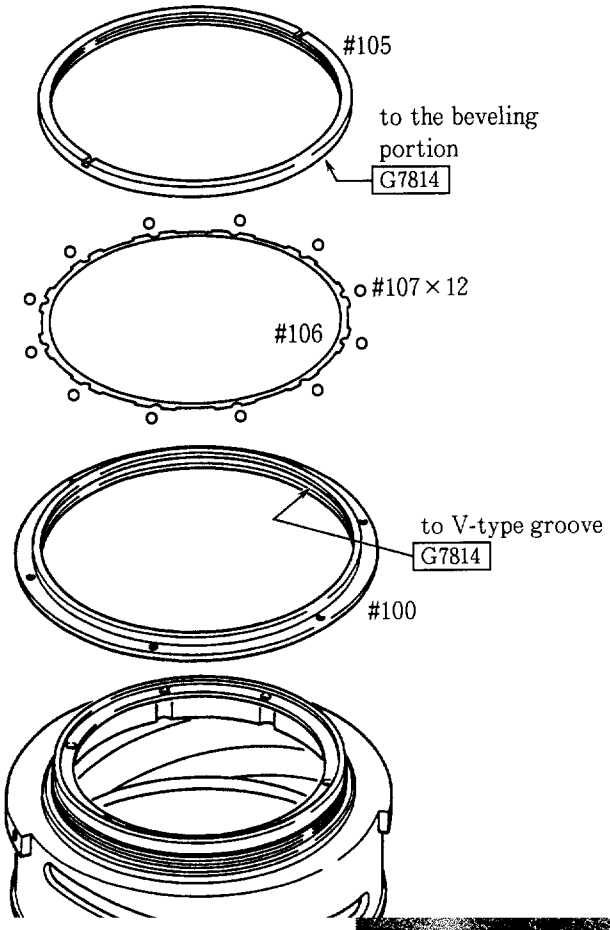


FRONT LENS HOUSING GROUP

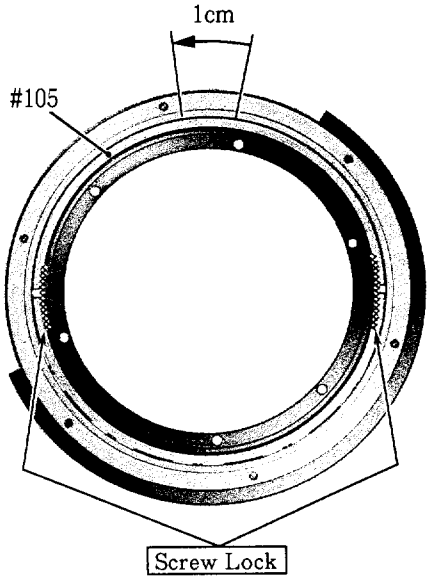
1. Mounting ball bearing





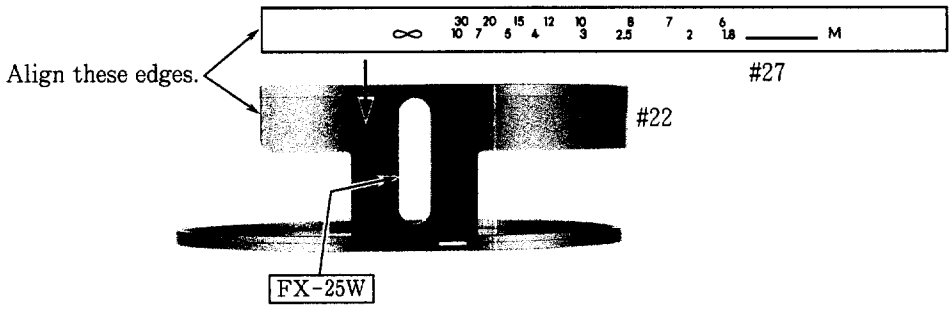


● Lightly screw in #105 as far as it will go. Rotate it by approximately 1cm (external circumference) reversely. (Refer to the picture below.)

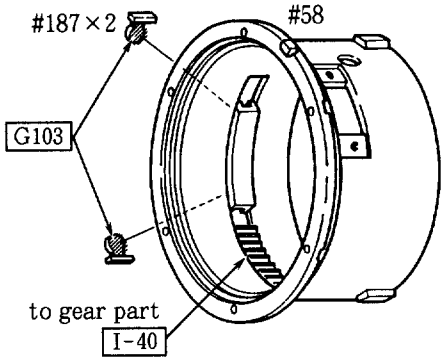


Inspection: Rotate #100 to check operation.

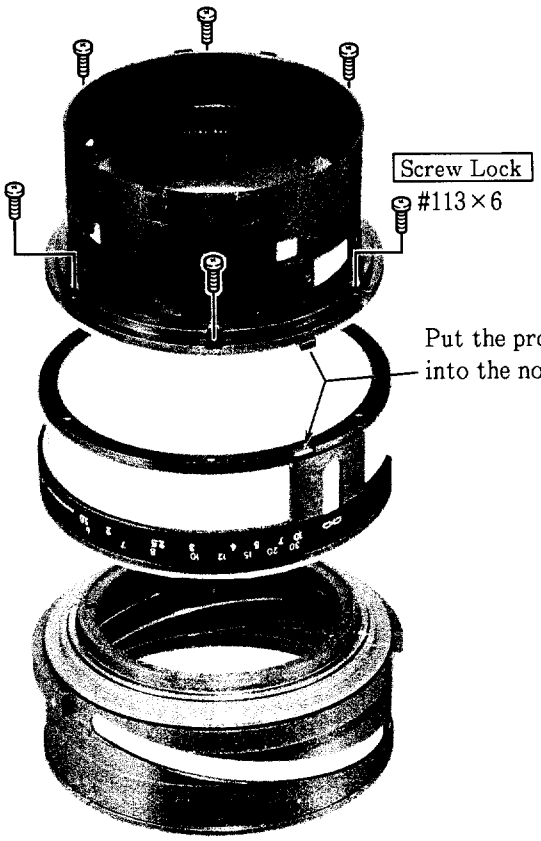
2. Attach the distance scale plate #27



3. Gear ring #58

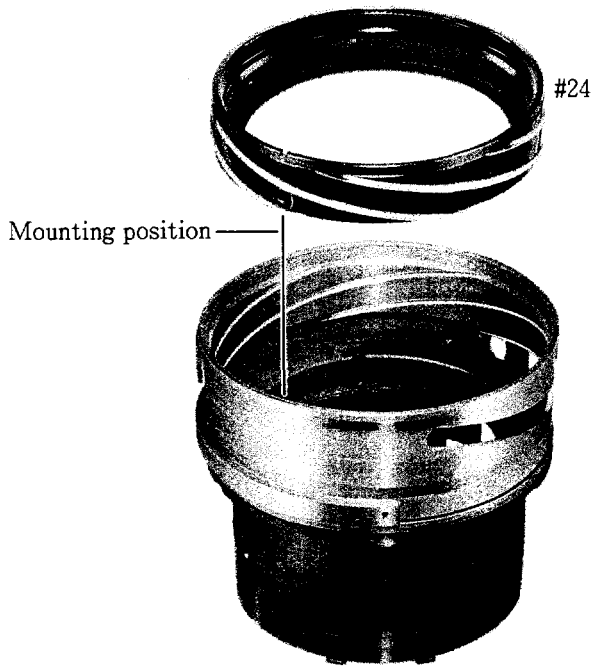


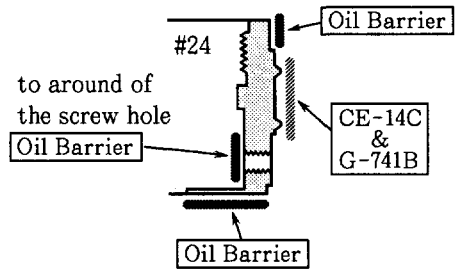
4. Assemble

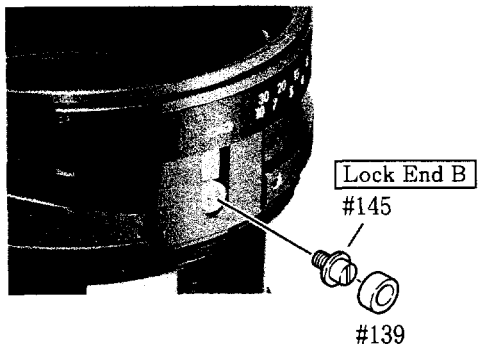


Inspection: Rotate the gear ring #58 to check operation.

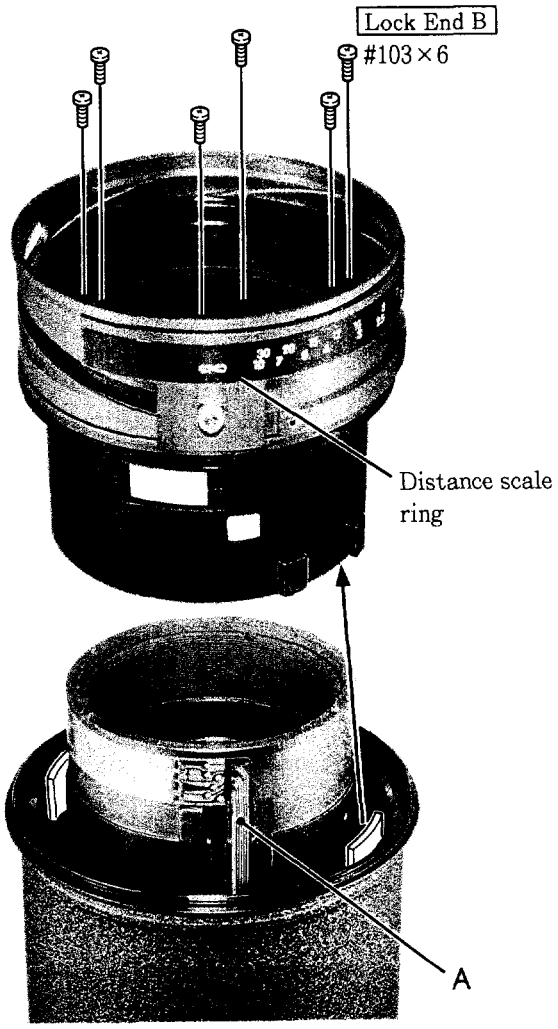
5. Front lens driving ring #24







6. Mount the front lens housing group



- Set the distance scale ring to the position as shown in the picture. And mount the front lens housing group.

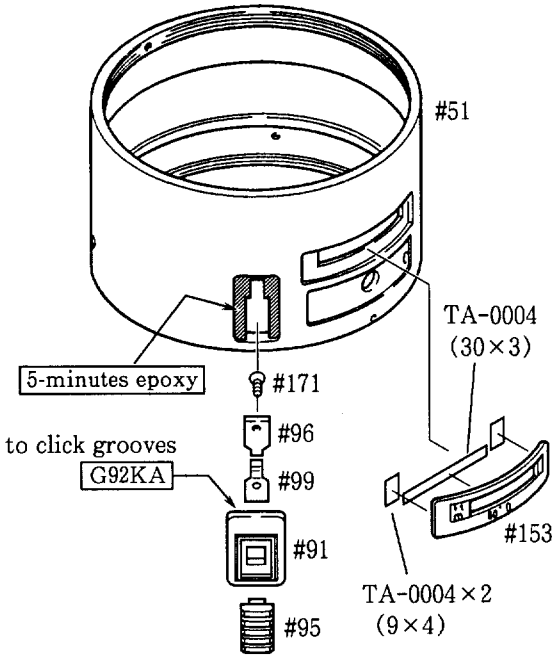
Note:

① Portion "A" on FPC should not lift off. If portion "A" lifts off, the front lens housing group might come into contact with the FPC with resulting damaging to the FPC.

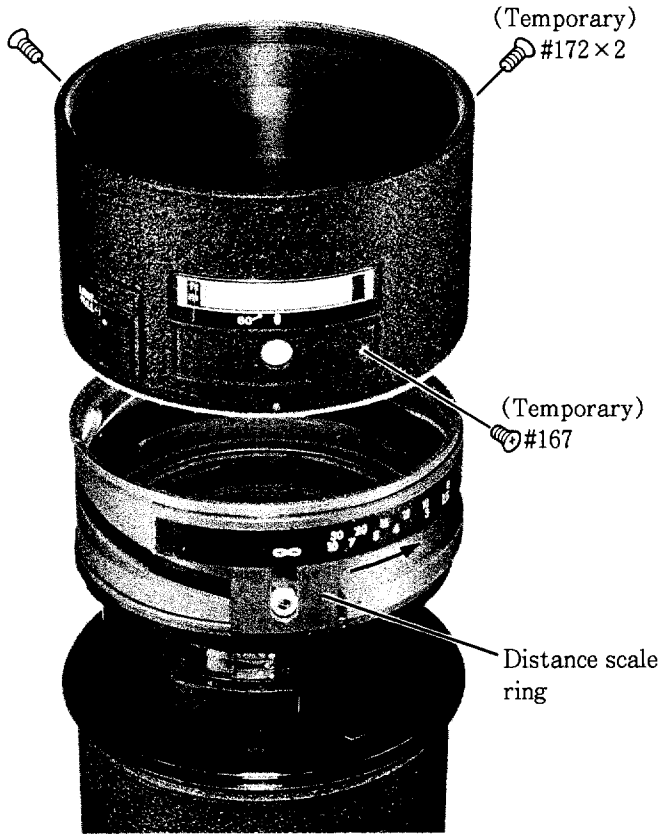
② Do not apply grease to the FPC encoder when mounting the front lens housing group.

Inspection: Set the A-M ring to "M". And rotate the zoom/focus ring to check operation.

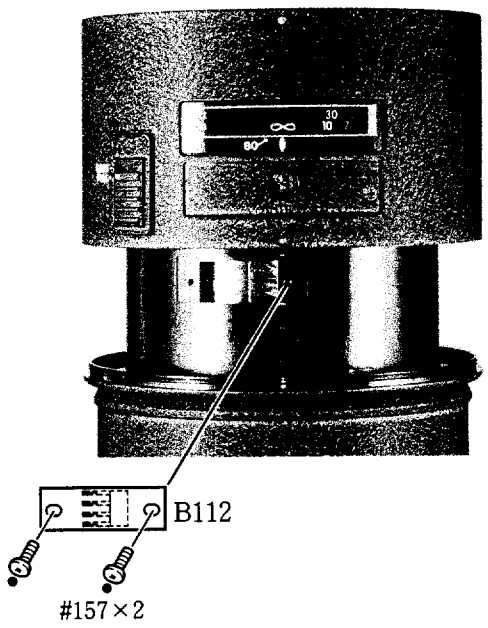
FOCUS RANGE RING #51



Note: Move the distance scale ring in the direction of the arrow since #96 might easily come into contact with the distance scale causing damage during mounting.



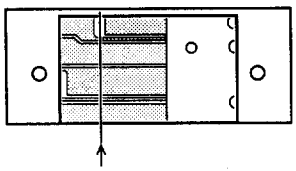
DISTANCE BRUSH B112



- Adjusting distance brush position

① Set the index to the ∞ (infinity) mark.

② Attach the distance brush B112 with screws #157×2 so that the distance brush comes into contact with the line, as shown in the figure below, when in the above state.



Make sure that the distance brush makes positive contact with the line.

③ Secure screws #157×2 using Screw Lock.

INSPECTION OF LENS DATA AND ENCODER SIGNAL

*Use an F90 camera body and checking & adjustment program for F90/N90 to display lens data and encoder signal on the computer monitor when making an inspection.

Inspection method

1. Screw external ring #59 (refer to page 41) into the focus range ring.
2. Start the checking & adjustment program for F90/N90 and select "E. Checking of AF lens communication". Make inspection according to instructions as shown on the display.
3. Lens data

   Lens data should be as described below even when the zoom and distance scale are at any positions.

   - ID number of the lens : 2 4
   - CPU version of the lens: 1 a
4. Encoder signal

   Encoder signal should be as described in the table below when the zoom and distance scale are set to specified positions. Encoder signal 3 and blanks are excluded for inspection.

   (1) When A-M ring is set to "M":

Zoom position / Distance scale position	f = 8 0 mm (80)		f = 1 0 5 mm (105–135, Center of the number "105".)		f = 2 0 0 mm (200)	
	Encoder signal		Encoder signal		Encoder signal	
	1	2	1	2	1	2
Most infinity position	1 9	c 2	7 9	c 2	c 9	c 2
∞					c 9	c 3
4 m					c f	c 3
Most close distance position					c c	c 2

: Adjusting position of zoom brush and distance brush.

   (2) When A-M ring is set to "A":

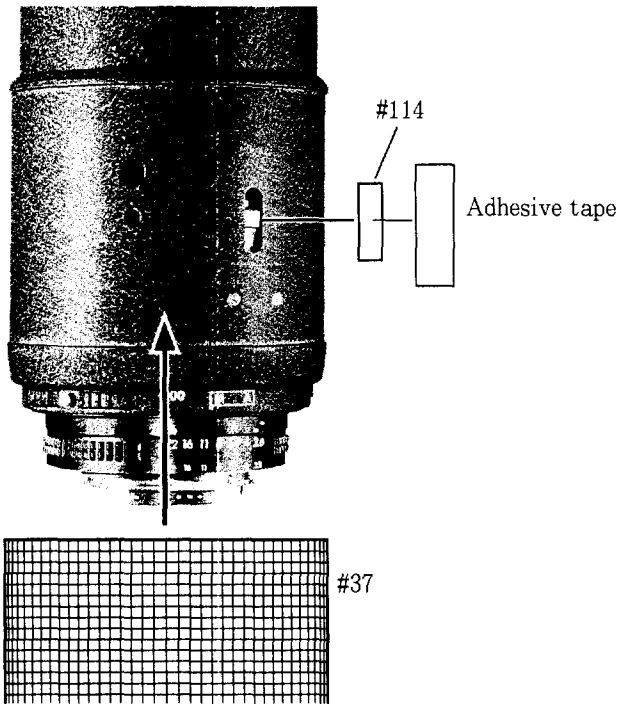
Zoom position / Distance scale position	f = 8 0 mm (80)		f = 1 0 5 mm (105–135, Center of the number "105".)		f = 2 0 0 mm (200)	
	Encoder signal		Encoder signal		Encoder signal	
	1	2	1	2	1	2
Most infinity position	1 9	d e	7 9	d e	c 9	d e

5. If lens data or encoder signal values are different from those shown in the table, following causes must be considered.

   (1) In case of lens data; Incorrect CPU is mounted on the FPC.

   (2) In case of encoder signal values; Encoder brush is mounted in the wrong position, brush or FPC is defective, encoder patterns on the FPC are contaminated, or the FPC is fixed in the wrong position.

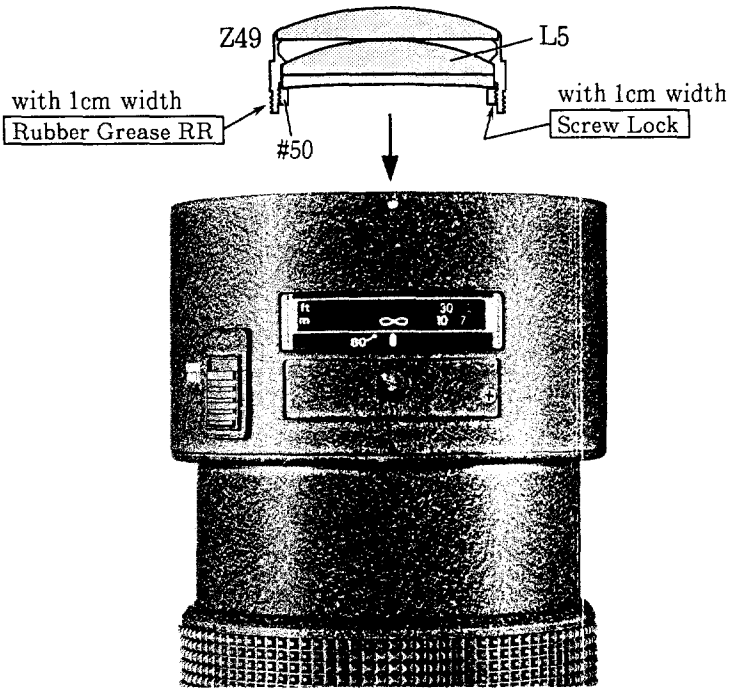
RUBBER RING #37



SPREAD CHINESE INK

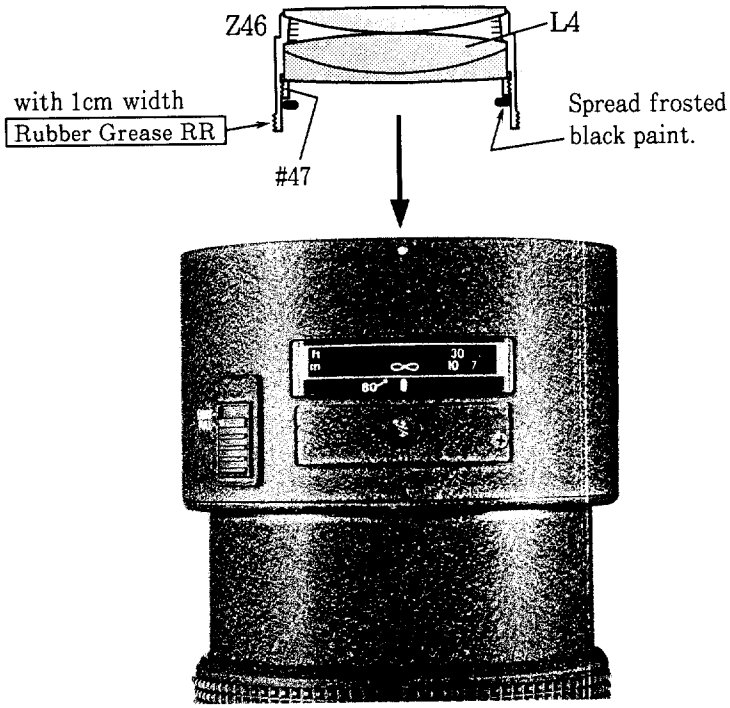
● Spread chinese ink (black frosted ink) on the sides of L1, L2, L3, L4, G8 and G16 lenses.

4th LENS GROUP



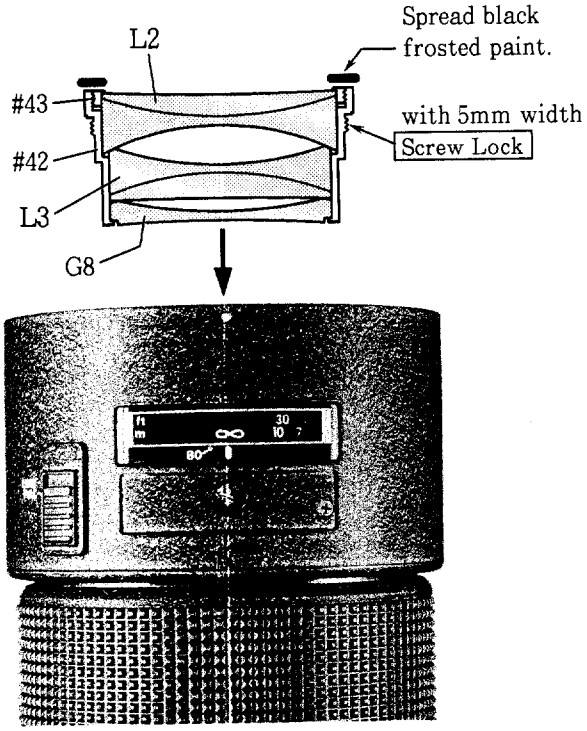
● Attach the 4th lens group using tool J11195B.

3rd LENS GROUP

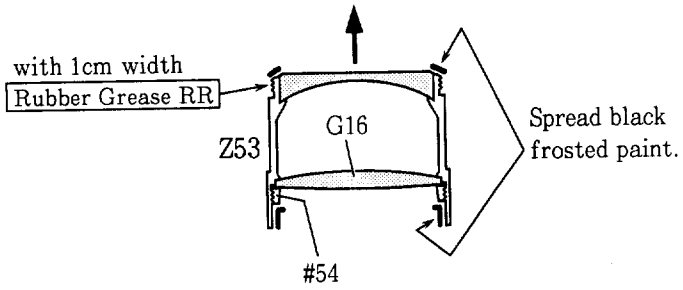


● Attach the 3rd lens group using tool J11195A.

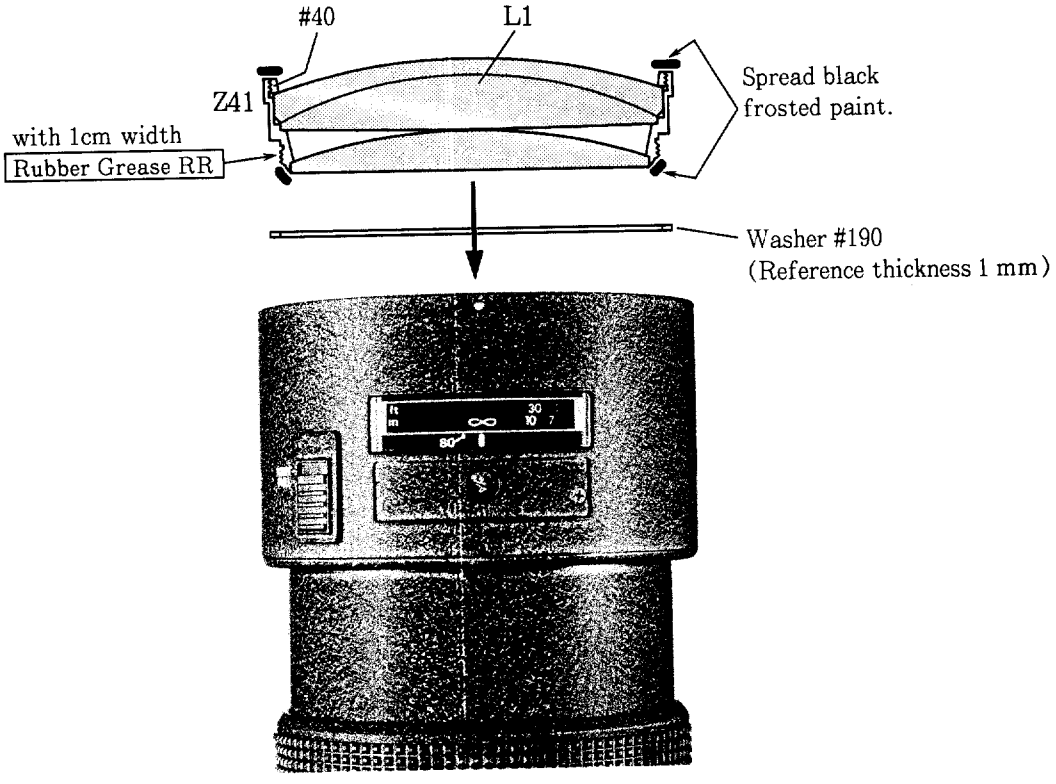
2nd LENS GROUP



REAR LENS GROUP



FRONT LENS GROUP



ADJUSTMENT AT BOTH ENDS OF FOCAL LENGHT

① Set the index to the ∞ (infinity) mark. Set the aperture to f/2.8.

② Read out the values at both Wide (f=80mm) and Tele (f=200mm) sides.

Note: The index and the ∞ (infinity) mark should align exactly.

③ Calculate the following equation.

$$\frac{T-W}{2.08}=A$$

where

T: Tele side value (mm)

W: Wide side value (mm)

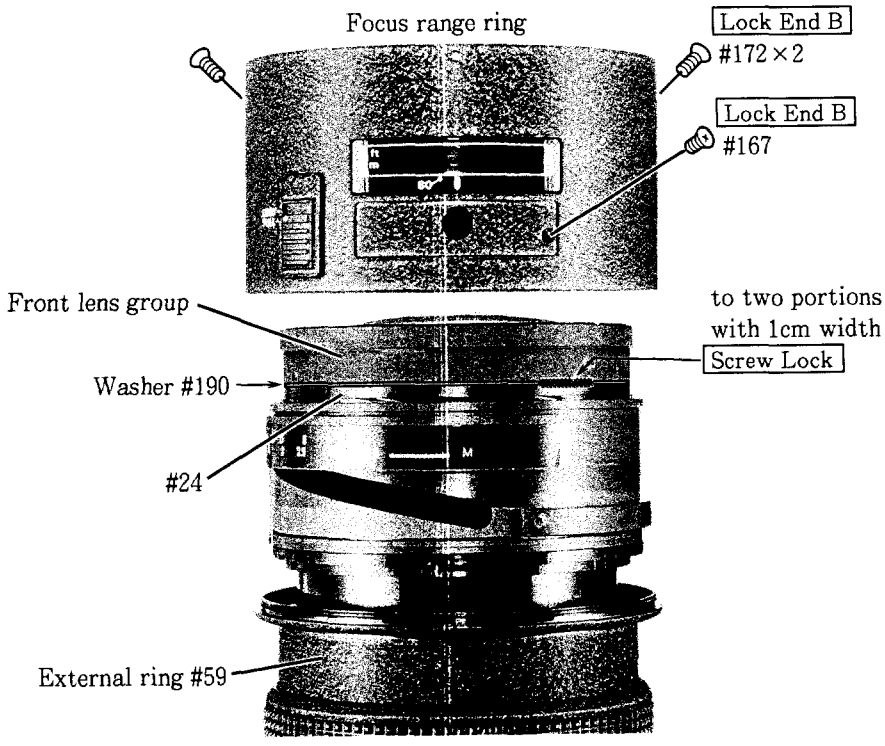
A: Adjusted amount of washer #190 (mm)

④ Adjust the thickness of washer #190 by the amount of value "A" obtained from the above equation. If the value is positive, decrease the thickness of the washer by that value and if it is negative, increase the thickness by that value.

Note: Insert a thin washer between thick washers.

⑤ Mount the front lens group and washer #190. And confirm that the difference between Wide and Tele side values is within 0.15mm.

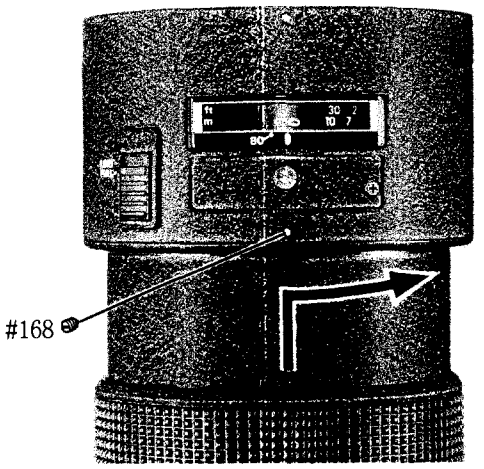
⑥ Remove external ring #59 from the focus range ring. Next remove the focus range ring. Check to see if washer #190 is securely inserted between the front lens group and #24. After confirmation, secure the front lens group and washer #190 using ScrewLock. (Refer to the picture below.)



⑦ Mount the focus range ring. Make sure to apply Lock End B to screws #167 and #172×2.

Note: Take care not to damage the distance scale.

⑧ Screw external ring #59 in to the focus range ring. and attach set screw #168.



ADJUSTMENT OF SHIFT (BACK FOCUS)

① Set the zoom/focus ring to Wide (f=80mm).

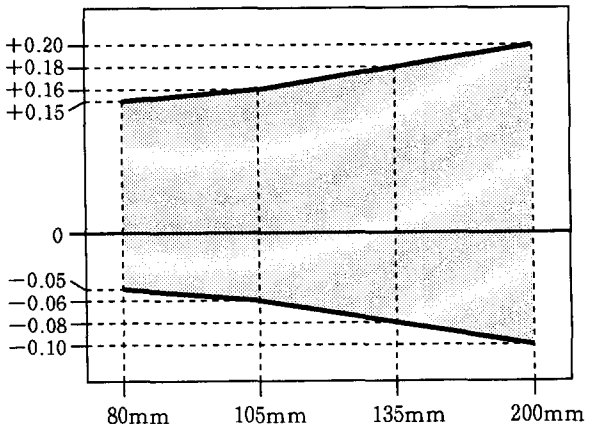
② Set the index to the ∞ (infinity) mark and set the aperture to f/2.8, and read M.B.f value.

③ If the readout value is greater than the standard value, increase thickness of the washer #137 by the difference, decrease the thickness of the washer #137 by the difference if the readout value is smaller than the standard one.

Remove bayonet mount group to adjust the thickness of the washer #137. (Refer to page 37.)

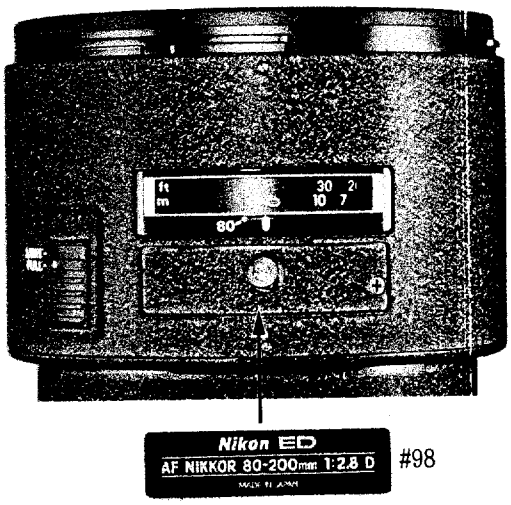
④ Check to see that the value is within the standard value range.

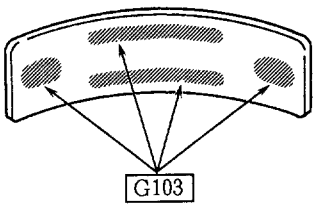
Focal length	Standard (mm)
80mm	−0.05 ~ +0.15
105mm	−0.06 ~ +0.16
135mm	−0.08 ~ +0.18
200mm	−0.10 ~ +0.20



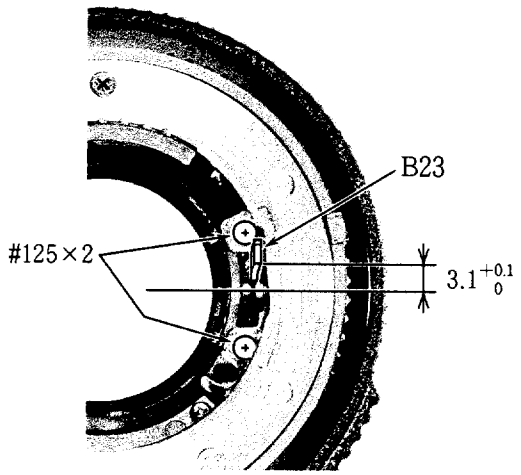
FILTER RING #38

NAME PLATE #98





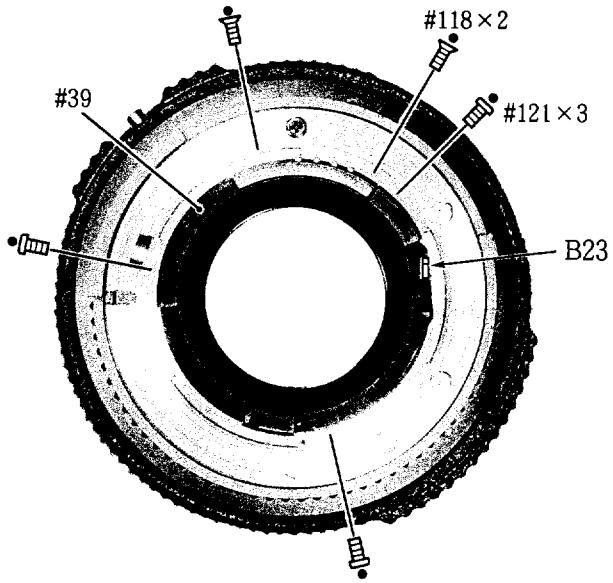
ADJUSTMENT OF APERTURE LEVER B23 POSITION



- Unfasten screws #125×2 to adjust the position of the aperture lever B23 so that it comes into the rated value of $3.1^{+0.1}_{0}$ to bring the aperture diameter whitin rated value at full aperture. Together with this, adjust the horizontal position so that it does not come in contact with the bayonet mount and rear cover ring. After adjustment, secure screws #125×2 using Screw Lock.

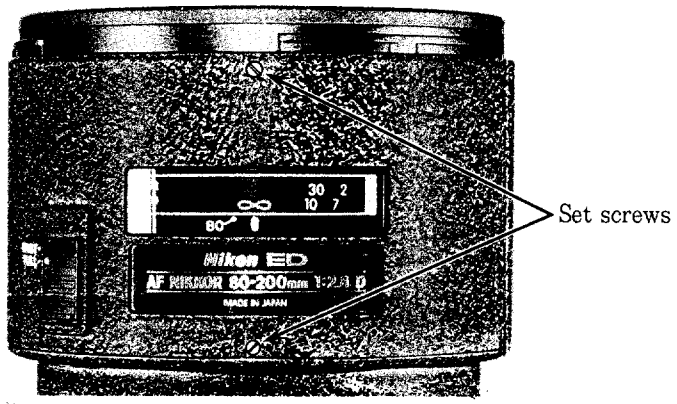
Reference: When adjusting the rated value of $3.1^{+0.1}_{0}$, set the aperture ring to f/2.8 and mount the tool J18004-1 on the bayonet mount. It becomes much easier to adjust if you mount the aperture lever B23 based on the groove of the tool as a reference.

REAR COVER RING #39



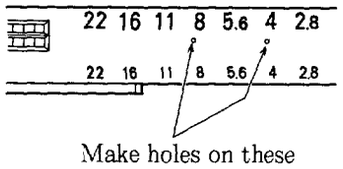
- Mount the rear cover ring #39 so that it becomes the full aperture stopper (the height of the aperture lever is $3.1^{+0.1}_{0}$mm) of the aperture lever B23.

SPREAD BLACK PAINT



- Spread black gloss paint onto the heads of set screws #168 and #169.

ATTACHING METER COUPLING SHOE



Make holes on these two concave portions.

① Remove the aperture ring #28.

② Make two holes φ1.1mm in the concave portions of the aperture ring #28.

③ Attach the meter coupling shoe.

Meter coupling shoe	1K406－029 ×1
Screws	1K010－002－1 ×2

④ Assembling.